FIRST WEST YORKSHIRE LIMITED

THE LEEDS TROLLEY VEHICLE SYSTEM TRANSPORT AND WORKS ACT ORDER

AND APPLICATIONS FOR RELATED PLANNING, LISTED BUILDING AND CONSERVATION AREA CONSENTS

STATEMENT OF CASE
ON BEHALF OF FIRST WEST YORKSHIRE LIMITED

DfT ref: TWA/13/APP/04/OBJ/923

30 JANUARY 2014

TRANSPORT AND WORKS ACT 1992
TRANSPORT AND WORKS (APPLICATIONS AND OBJECTIONS PROCEDURE) (ENGLAND AND WALES) RULES 2006

TRANSPORT AND WORKS (INQUIRIES PROCEDURE) RULES 2004

PLANNING (LISTED BUILDINGS AND CONSERVATION AREAS) ACT 1990

TRANSPORT AND WORKS APPLICATIONS (LISTED BUILDINGS, CONSERVATION AREAS AND ANCIENT MONUMENTS PROCEDURE) REGULATIONS 1992

THE LEEDS TROLLEY VEHICLE SYSTEM ORDER

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APPLICATIONS FOR RELATED PLANNING, LISTED BUILDING AND CONSERVATION AREA CONSENTS

BY WEST YORKSHIRE PASSENGER TRANSPORT EXECUTIVE

AND LEEDS CITY COUNCIL

STATEMENT OF CASE
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30 JANUARY 2014

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1 Introduction and background

1.1 This Statement of Case ("Statement of Case") is filed on behalf of First West Yorkshire Limited in respect of the Leeds Trolley Vehicle System Transport and Works Act Order ("the Order"), promoted by West Yorkshire Passenger Transport Executive and Leeds City Council ("the Applicants"). In addition, the Applicants have submitted a request for a direction as to deemed planning permission to the Secretary of State under Section 90(2A) of the Town and Country Planning Act 1990. A number of applications for listed building consent and conservation areas have also been submitted in respect of the works proposed to be undertaken along the route as part of the overall scheme.

1.2 First West Yorkshire Limited ("FWY") is a licensed bus operator operating registered local bus services under the 1985 Transport Act throughout the City of Leeds and across the whole of West Yorkshire. In particular, it operates several services along, or parallel with, the proposed route of the Leeds Trolley Vehicle System ("LTVS" or "Proposed Scheme").

1.3 FWY fully supports the principle of improving the public transport system in Leeds and indeed throughout West Yorkshire. FWY is itself actively engaged in delivering a high quality transport system and is continuing to work towards an improved public transport system for Leeds in particular and West Yorkshire generally. However, the LTVS - certainly in its current form - would not deliver the benefits claimed in the planning statement. Indeed, it is very likely that the LTVS would, in fact result, in material adverse planning harm. Furthermore, it has not been demonstrated that the LTVS would offer value for money for the tax payer and end user. The LTVS scheme has not been "future proofed". Furthermore, there has been no comprehensive evaluation of options alternative to the LTVS and the models that have been provided have not been analysed correctly.

1.4 FWY wishes to work with the Applicants to deliver the most appropriate rapid modern transport system for Leeds and the wider Leeds City Region.

1.5 This Statement of Case is filed in support of the matters noted in the FWY objection dated 30 October 2013 ("the Objection") (appended to this statement as Appendix 1) and the further matters raised in this Statement of Case.

2 First West Yorkshire: Interest in the Order

2.1 The Order seeks to enable the construction and operation of a trolley vehicle system in the City of Leeds. The proposed system comprises two routes from the city centre, one north through Headingley to a park and ride site at Bodington and then on to Holt Park, and one south to a park and ride site at Stourton.

2.2 As a commercial bus operator operating local bus services registered under the provisions of the Transport Act 1985, First West Yorkshire and its customers would be substantially adversely affected by the Order.

2.3 FWY's operations in the City of Leeds carry approximately 51 million passenger journeys per annum, of which some 12.4 million would be directly affected by the Order. 94% of FWY's services are operated on a commercial basis. The services enjoy high levels of customer satisfaction, with 84% either satisfied or very satisfied according to independent research undertaken between September and December 2012 by Passenger Focus (the appointed statutory representative of the interests of bus passengers under the Local Transport Act 2008).

2.4 The granting of the Order and the subsequent operation of the proposed LTVS scheme would have several effects on FWY's operations and customers. These effects may be summarised as:

(a) abstraction of existing passenger demand on routes operated along the corridor, requiring a reduction in frequency and/or hours of operation in order to maintain commercial viability.;

(b) the risk of increased journey time on the routes that continue to be operated along the corridors affected: this would both make the routes more expensive to operate and less attractive to customers, further threatening the commercial viability of the services and depressing passenger use; and

(c) the reduction in frequency of services would affect a number of outlying areas in the city not served by the LTVS, which would mean those areas either being disconnected from the public transport network or experiencing a reduction in the breadth and frequency of service they receive, and thereby depressing passenger use.

2.5 The effects outlined above would act to the detriment of FWY's existing customers in such a way as to offset substantially any advantages which might accrue to potential users of the LTVS system, and risk a modal switch away from public transport to private transport sufficient to offset or reduce any modal switch to public transport achieved by the implementation of LTVS.

2.6 On the other hand, the introduction of a properly integrated approach to public transport provision on the corridors concerned, allowing existing services to take advantage of proposed infrastructure improvements, would enhance the service received by a much wider cross-section of the city's population. This could be achieved without such a large and technically questionable project and at much lower cost to the public purse. Consequently, FWY take the view that an alternative scheme (the "New Bus for Leeds") should be pursued which would deliver at the very least the same benefits as those claimed by the Applicants, but more efficiently and cost effectively.

2.7 The services provided under the Order boundary would substantially overlap with the FWY network. A plan showing the extent of the overlap is attached at Appendix 4 of this Statement. This is inefficient and not environmentally sustainable.

2.8 Furthermore, in so far as the LTVS would compete with existing and future FWY operations, FWY is concerned that the state funding of the LTVS is unfair and anti-competitive and may amount to an unlawful state aid.

3 Key issues with the Order

3.1 The choice of wired trolleybus technology is seriously flawed. It makes the LTVS project unnecessarily expensive, visually intrusive, inflexible and unresponsive to change both immediate and longer term.

3.2 The choice of a bespoke trolley bus system for Leeds carries with it the inherent vulnerability and high cost associated with the employment of a technology which is used only in a limited number of locations overseas and for which the market is fragmented and small. This calls into question the long term resilience of the LTVS. The higher costs, in time and money in sourcing and supply spare and replacement parts, such as additional and replacement vehicles, are obvious issues of the problems inherent with such a choice. It also raises questions as to whether there is sufficient worldwide market to support continued innovation and improvements in the wired trolley technology.

3.3 In addition, FWY and its advisers have serious concerns about the modelling work that they have so far been able to review, suggesting that the demand and revenue for the proposed system is significantly overstated. As a consequence of this, and the flaws with the system specification and design, FWY does not believe that the LTVS even on the terms presented by the promoters of the scheme would deliver the benefits claimed for it, for users or for the wider economy in West Yorkshire.

3.4 Furthermore, the claimed benefits set out in the Planning Statement can be delivered by a newly developed approach to the provision of bus and rail services and bus and rail infrastructure, spreading benefits more widely across the city more quickly, more efficiently and cost effectively. In particular, FWY is developing the New Bus for Leeds - a new approach to bus services on the corridor and in other areas of Leeds which involves:

(a) an innovative redesign of the vehicle and ticketing systems to achieve a substantial reduction in boarding and alighting times at stops;

(b) reduced and eventually zero emissions at the point of service delivery;

(c) a range of infrastructure measures to reduce journey times and improve reliability; and

(d) improved bus stops with level boarding, better shelters and enhanced information systems.

This approach could be introduced more quickly, at lower cost to the taxpayer, with no ongoing revenue risk to the public sector. Furthermore, it can be rolled out rapidly across the whole of the Leeds bus network.

3.5 The LTVS as proposed does not deliver value for money and is unnecessary in its current form. There are better and more cost effective ways of improving transport provisions throughout Leeds by investing in bus and rail infrastructure (Ground 1). In particular:

(a) It is doubtful whether the Order is capable of delivering the claimed reduction in public transport journey times, particularly at peak times (Ground 1a);

(b) The deliverability of the claimed improvements in journey time punctuality is highly questionable (Ground 1b);

(c) the provision of the proposed high quality stops with shelters and real time information offering level boarding to the vehicle does not depend on the implementation of LTVS and can be delivered for existing services (Ground 1c);

(d) FWY supports the provision of park and ride sites at key locations attractive to city bound traffic, but the LTVS services would not be necessary to make the proposed park and ride sites and passenger services work (Ground 1d)

(e) The claimed benefit of "modern passenger vehicles offering improved quality of travel" is already being delivered by FWY across its network in Leeds, using existing technology and does not require the LTVS in order to be implemented (Ground 1e);

(f) The claimed benefit of "linkages to the north and south of Leeds would be made easier for people to travel to work and improved access to key destinations would be made across the route" for the LTVS system has not been demonstrated. Indeed, in some cases existing linkages would be jeopardised (Ground 1f);

(g) Claimed reductions in congestion and improvements to air quality are overstated and would not be delivered by the granting of the Order (Ground 1g);

(h) The economic and employment benefits of the proposed Order have been overstated in the Planning Statement and would not be achieved (Ground 1h);

(i) The claimed 3% increase in output equivalent to an annual £176 million boost to the local economy is not robust (Ground 1i);

(i) alternatively, and without prejudice to FWY's principal case, if contrary to the above the principle of the LTVS is nonetheless accepted, then it should be

modified in order to maximise the benefits it could deliver and reduce the cost to the public purse (Ground 2);

(ii) FWY is obviously extremely well placed to understand and explain local demand. FWY was and is able to share its expertise and experience but it has not been involved by the promoters with the planning of the LTVS. (Ground 3)

3.6 Further details on these grounds are also set out below.

3.7 FWY reserves its right to add to or amend these grounds should that become necessary as a result of further information, plans or specifications which affect the LTVS scheme, and for example, in respect of any revised business case produced by the promoters of the scheme.

4 Ground 1: Necessity for, and benefits of, the scheme

4.1 It is well established that a compelling case in the public interest must be made to acquire property by compulsory acquisition.

4.2 In applying for rights to operate a public transport service at the commercial risk of a public sector body, an equally compelling case in the public interest needs to be made. This is especially true in circumstances such as the present where the result of the operation would be to materially damage an existing, successful and well-regarded service provided to the public at no risk to the public purse by a private sector body.

4.3 The Order and its supporting documentation appears to provide a compelling case in the public interest. FWY has commissioned a review of the Business Case for the LTVS Project, submitted to the Department for Transport on 30 March 2012 and known as the Programme Entry Business Case Submission ("PEBCS"). The review was undertaken by the specialist public transport consultants The TAS Partnership, whose report ("The TAS Report") is submitted as Appendix 2. It is recognised that the PEBCS may be superseded by a further Business Case submission prior to the Public Inquiry being convened, in which case as foreshadowed above FWY reserves the right to commission a further review of that document or such work as may be necessary, and to present it to the Inquiry as part of FWY's evidence.

4.4 The Objection sets out, at paragraph 2, FWY's views on the detailed claims for the benefits of the LTVS set out in the Planning Statement submitted by the Applicants in support of the Order.

4.5 Despite the claim made in the Planning Statement of significant benefits to passengers, the LTVS is in fact likely to result in a two tier public transport system in Leeds to the significant detriment of existing bus services in Leeds and the wider West Yorkshire area.

4.6 At Appendix 4 to this Statement, FWY provides details of the services it currently runs on the corridor which would be affected by the granting of the Order and the construction and operation of the LTVS. FWY believes that a "two tier" service would result from:

(a) the provision of separate stops of a different quality for LTVS and the parallel bus services;

(b) the provision of priority measures solely for the LTVS which could not be used by parallel local bus services;

(c) the risk of increased delays on other bus services which cross or otherwise interact with the proposed LTVS route in the city centre, resulting from priority measures provided for LTVS. Services using The Headrow, Boar Lane, City Square, Park Row and Leeds Bridge would all be at risk of additional delay if total priority is granted to LTVS;

(d) the need to reduce the frequency and/or the hours of operation of existing services along the corridor which also serve areas of the city not served by LTVS.

4.7 Analysis of passenger statistics on the FWY network in The TAS Report shows that the services affected by the Order and listed in Appendix 4 currently carry some 12.4 million passenger journeys per annum, of which some 41% make journeys that would be replicated by the LTVS services (5.1 million passenger journeys per annum). However, the journeys of the remaining 59% - a total of 7.3 million passenger journeys per annum - would be at risk of being made less frequent, slower and more expensive by the granting of the Order and the implementation of the LTVS scheme.

4.8 In any event, the claimed benefits set out in the Planning Statement could be delivered by more flexible bus based alternatives such as the New Bus for Leeds. This would spread benefits more widely across the city more quickly, more efficiently and cost effectively. The New Bus for Leeds would include the following improvements:

(a) the introduction of vehicles with multi-door boarding and alighting similar in concept to the "New Bus for London" (known also as the "New Routemaster") recently introduced by Transport for London;

(b) smart ticketing to reduce and eventually eliminate cash payment on the vehicle;

(c) signal priority and a more limited programme of infrastructure improvements;

(d) use of kerb guidance or Kassel kerbs to facilitate level boarding and alighting:

(e) the use of low emission technology (hybrid, battery or compressed natural gas);

(f) a system of access charges by operators for dedicated bus infrastructure similar to those developed in Cambridge and Luton to ensure a revenue stream for the public sector to fund maintenance and future development of bus infrastructure throughout West Yorkshire.

4.9 An outline of the development of the New Bus for Leeds is set out in Appendix 3.

4.10 FWY supports the introduction of rail electrification on the Leeds-Harrogate rail corridor, to provide higher frequency services into Leeds city centre from existing and potential new stops in the Headingley, Horsforth and Weeton areas, coupled with park and ride sites and a link to Leeds Bradford Airport. Improvements to both frequency and journey time for longer distance trips from areas adjacent to and outside the Ring Road in North West Leeds could be achieved. These would be sufficient to attract motorists out of their cars with the achievement of real reductions in traffic congestion on the A660 corridor.

4.11 The detailed comments contained in paragraph 2 of the Objection are further amplified in the sections below.

5 Ground 1a: Claimed reductions in public transport journey times

5.1 The Objection sets out at paragraph 2.6 the grounds which FWY has for doubting whether the LTVS will achieve a reduction in public transport journey times, especially during peak hours. Journey times by public transport comprise several elements, including access time from home to the boarding point ("walk time"), waiting time for the next vehicle ("waiting time"), the time actually spent in the vehicle ("IVT") and access time between the alighting point and the passenger's final destination which amounts to another "walk time". Taken together these elements are known as generalised journey time ("GJT").

5.2 Three grounds for doubting have currently emerged from the material produced to date by the promoters as to whether LTVS will actually make an overall difference to the GJT of a majority of users on the corridors served by the Proposed Scheme:

(a) experience has demonstrated that journey times on the corridor are exceedingly difficult to predict with any accuracy on a day to day basis, with factors such as school holidays, university vacations, weather conditions and other perturbations such as accidents, road works or illegal parking all determining congestion levels and the location of delays. Analysis of electronic ticket machine data shows that existing bus journey times can vary between 24.7 minutes and 70.6 minutes depending on the time of day and prevailing traffic conditions. Thus, the scheduled weekday running time on service 1 from the city centre to Holt Park currently varies between 25 minutes and 45 minutes, depending on the time of day. Prudence would suggest that the approach adopted such be a precautionary one and that the IVT used should be the greater of these sums. The longer time is the more appropriate IVT because this would best reflect the passenger perception;

(b) there is a real risk that by increasing the delays to other traffic either using the same route as LTVS or crossing the alignment, the journey times of other bus services running alongside and/or intersecting the LTVS alignment will be increased. This would offset any gains in travel journey times by passengers using the service, as well as, potentially increasing the GJT for users of those services, producing an economic disbenefit, as well as adding costs of operation to the network which bus operators would have to pass on to their customers in the form of higher fares;

(c) passengers using the existing bus services which run along the LTVS alignment, at a frequency of six buses per hour or more, but serve other parts of the city, are likely to experience a reduction in frequency as a result of the abstraction of patronage by LTVS. This will increase the waiting time these passengers experience, so increasing the GJT of their trip, and making the offered level of service less attractive and convenient. An increase in GJT for users of existing bus services along the corridor or adjacent to it would represent a disbenefit of the LTVS scheme which has not been allowed for in the Business Case of the Project. As noted above, this potentially affects 7.3 million passenger journeys per annum not served by LTVS. Areas affected by service reductions or even withdrawals are likely to include:

(i) Holt Park (those areas not served by the LTVS alignment), Cookridge and Tinshill (Services 1 and 6)

(ii) Horsforth (Services 6 and 97);

(iii) Yeadon and Guiseley (Service 97);

(iv) Weetwood Lane and Adel (Service 28);

(v) Middleton and areas of Belle Isle south of Belle Isle Circus (Services 12, 13, 13A);

(vi) Middleton, Chapeltown and Wigton Moor (Service 48);

(vii) Middleton, Morley and Bramley (Service 85);

(viii) Pudsey, Cottingley and Morley (Service 87).

5.3 Unlike the LTVS, the New Bus for Leeds will deliver journey time improvements to bus passengers in the vast majority of these areas without risk of reducing service frequencies.

6 Ground 1b: Claimed improvements in service levels and punctuality

6.1 The Objection sets out at paragraph 2.7 et seq the reasons why FWY disputes the benefit claimed by the Applicants in the Planning Statement of "Improving the journey time punctuality coupled with high frequency services from early morning to late in the night".

6.2 FWY already provides high frequency services along the full length of the proposed LTVS route, and for some parts of the corridor provides departures for 23 hours a day on most days of the week. Times and frequencies are kept under review and regularly adjusted in accordance with passenger demand. FWY's bus services on the corridor were increased and extended in both June and December 2013. The combined frequency of all current operations along the proposed LTVS corridor provides a cumulative passenger benefit, which is threatened by the LTVS proposal.

6.3 As noted in paragraph 5.2 (a) above, journey times on the corridor are exceedingly difficult to predict with any accuracy on a day to day basis. FWY does not accept that the proposals contained in the Order would offer reliable and consistent improvements in punctuality. However, where improvements to infrastructure and junction design can be made to reduce congestion and improve speed and reliability for public transport vehicles, FWY would warmly support their introduction, provided that these were made available for all public transport services on the corridor. It would not be necessary to grant the Order for the Applicants' proposals in this regard to be implemented.

6.4 The New Bus for Leeds would result in improvements to service levels and punctuality due to a combination of traffic priority and reduced stop dwell time. By contrast to the LTVS, a bus based improvement and the New Bus for Leeds in particular possesses the ability to respond quickly and flexibly to changes in demand such as serving new developments and attractions and changes and improvements in technology.

7 Ground 1c: High quality stops with shelters, real time information and level boarding

7.1 The Objection sets out at paragraph 2.9 et seq FWY's belief that the provision of the facilities outlined is not dependent upon the granting of the Order nor on the implementation of the LTVS scheme.

7.2 Level boarding at stops is not a function of the proposed trolley system, and would require some form of guidance to be achieved successfully by the proposed vehicles in the same way as conventional buses. Two forms of design exist to enable buses to align correctly to achieve level boarding for customers: kerb guidance for buses using small lateral wheels and the "Kassel kerb" - a raised kerb of a special design to allow the front wheel of the bus to be aligned correctly. The guided bus concept has been operated elsewhere in three locations in West Yorkshire (Scott Hall Road, Leeds; York Road/Selby Road, Leeds and Manchester Road, Bradford) for a number of years. The system has also been applied in Cambridge, Crawley, Ipswich and Luton. Kassel kerbs are deployed widely in London and other cities. As the proposed LTVS vehicles would be rubber-tired and be of a similar design to a conventional bus, it would be necessary to use either Kassel kerbs or kerb guidance to achieve level boarding.

7.3 The provision of shelters and real time information systems is widespread practice for conventional buses throughout the UK and they would be provided as part of the New Bus for Leeds, and indeed by any further improved bus based travel system. It is clear that these benefits can be achieved without the LTVS and the granting of the Order is therefore unnecessary.

8 Ground 1d: Concerns regarding the proposed Park and Ride sites

8.1 The Objection notes at paragraphs 2.12 et seq that FWY supports the provision of Park and Ride services and networks. Indeed, FirstGroup overall operates some 16 bus services linking town and city centres with dedicated parking areas on the outskirts. These are operated either commercially or under contract to local authorities. FWY itself operates the King Lane site in Leeds and will also operate the new Park and Ride site at Elland Road. It also manages the highly successful network in York, where a new site is under construction at Poppleton and due to open in the Spring of 2014. This Park and Ride along with the site at Monks Cross will be operated by electric vehicles without the need for expensive wiring.

8.2 The provision of Park and Ride sites is not dependent upon the granting of the Order or on the implementation of the LTVS scheme. The provision of such Park and Ride sites would also deliver the same benefits in conjunction with the New Bus for Leeds or other bus based improvements.

8.3 It is important to note, too, that there are serious doubts as to the utility of the Applicants' particular proposals for Park and Ride. The overwhelming majority of successful bus-based park and ride schemes in the UK rely on a dedicated, express bus service between the site and the town or city centre. Without such provision, it is highly questionable whether the proposed sites at Bodington and Stourton will prove sufficiently attractive to deliver their forecast impact on traffic flows and congestion in the corridors concerned. FWY notes that evening peak return trips by Park and Ride users will be particularly unattractive as they will be required to compete with other users in order to board a vehicle in the city centre.

9 Ground 1e: Claims concerning modern passenger vehicles offering improved quality of travel

9.1 The Objection notes in paragraph 2.15 et seq that the fleet of vehicles currently deployed by FWY to operate bus services on the LTVS corridor have an average age of three years. All operate with air suspension and the latest technological advances to provide the best available ride quality to FWY's customers, subject of course to the smoothness and evenness of the road surface upon which they travel.

9.2 The vehicles proposed for the LTVS are a similar design with identical wheels and suspension systems to a conventional diesel, hybrid or battery powered bus. As noted, ride quality is a function of vehicle design and road surface quality. FWY does not therefore accept the assertion that the granting of the Order and implementation of LTVS would of itself improve the quality of travel in a way that could not be delivered for existing bus services on the corridor.

9.3 In order to provide the peak capacity on the proposed design of a single articulated trolley vehicle, it is inevitable that the ratio of seats to standing spaces would be lower than on a conventional bus, so offering a reduced standard of comfort and safety for passengers, particularly older customers and passengers with restricted mobility. Thus, the capacity of a three-door articulated bus (as used in London between 2002 and 2011 and of similar dimensions to the proposed trolley vehicles in Leeds at 18 metres long) is 149 passengers, 49 seated and 100 standing, providing a ratio of 33% seats to total capacity. A standard FirstGroup double decker bus as is currently used to operate services on the LTVS corridor offers 72 seats and is licensed to accommodate 22 standing passengers (offering a ratio of 77%). The "New Routemaster" in London offers 62 seats and is licensed to accommodate 18 standing passengers (78%).

9.4 The operation of light rail systems in UK towns and cities also goes to demonstrate that vehicles with lower proportions of seating capacity are less attractive to older people and consequently carry a lower proportion of concessionary pass holders on their services. This is discussed further in paragraph 4.3 of The TAS Report at Appendix 2. The New Bus for Leeds or similar alternative which provides more seating capacity would be a preferable solution.

10 Ground 1f: Improvements in connectivity

10.1 Paragraphs 2.18 and 2.19 of the Objection disputes the validity of the assertion made in the Planning Statement that linkages between North Leeds and South Leeds would be made easier by the granting and implementation of the Order. FWY does not believe that the LTVS would make it easier for people to travel to work or offer improved access to key destinations. Other than the University, the LTVS does not serve the main employment locations.

10.2 The map at Appendix 5 shows the nature and extent of cross city links that are currently provided by the bus network in Leeds, which could be jeopardised by the LTVS proposals. This is because cross city services (including LTVS) are notoriously subject to reliability issues resulting from

congestion, which could be worsened by the proposed scheme. This would increase customers' journey times, potentially leading to reduced demand, so threatening the viability of some services. At the same time, existing bus services on the LTVS corridor would be reduced, making linkages to parts of the city not served by LTVS less frequent, less attractive and also threatening their viability. This would have the potential for a knock on adverse impact upon connectivity and accessibility to the wider range of services across the city.

10.3 Further cross city services and links can be introduced if additional priorities were to exist, and the potential is apparent from the schedule at Appendix 6 which shows existing terminating services and how they could be linked together to improve cross-city linkages if services could be operated reliably. In the Appendix, FWY identifies certain key trip attractors (e.g. St James's Hospital, key suburban centres, other employment/development sites) where resources could be invested in better connectivity.

10.4 The New Bus for Leeds offers a much more flexible solution which would avoid the adverse impacts identified above and would enable significant improvements to accessibility and connectivity across a much wider area of the city without inconveniencing existing bus users.

11 Ground 1g: Claims concerning reductions in congestion and improvements to air quality

11.1 In paragraphs 2.20 and 2.21 of the Objection, FWY expresses grave doubts about the number of car journeys that would switch to LTVS and the consequent improvements in congestion and air quality claimed in the Planning Statement submitted by the Applicants in support of the Order.

11.2 In the review commissioned from advisers by FWY and submitted at Appendix 2, an analysis of the figures submitted by the Applicants in the PEBCS for the LTVS scheme has been carried out. This suggests that the number of cars crossing the cordon in 2012 was 5% lower than assumed in the Applicants' model on the north side and 16% lower on the south side (see Appendix 2, section 5.11).

11.3 In addition, the report suggests that the Annualisation Factors used by the Applicants to multiply from a single hour forecast into an annual one have been overstated, and fail to take account of the differing sub-markets in the city (Appendix 2, section 5.4).

11.4 As noted above in paragraph 5.2, there is a serious risk that by increasing the GJT of existing bus passengers, a switch of journeys from bus to car is encouraged, offsetting any switch from car to LTVS which might be achieved.

11.5 Given these factors, FWY does not believe that the relatively small reduction in car traffic promoted by the LTVS would make a significant contribution to air quality in the city.

11.6 FWY is of the view that a much more significant improvement in air quality across the whole city could be achieved by the introduction of hybrid, electric or gas powered buses across the whole network proposed as part of the New Bus for Leeds. FWY is already operating a fleet of hybrid buses on the Scott Hall Road corridor in Leeds and its parent company is committed to introducing new technologies. FirstGroup plans to move to use vehicles which are emission free as soon as suitable types are available with the right level of reliability.

11.7 Air quality improvements could be delivered if the appropriate level of priority is provided for bus services. Such priority measures would ensure any inefficiencies in the deployment of these vehicles on the network can be eliminated, reducing emissions from stationary diesel engines.

12 Ground 1h: Claims concerning employment generation

12.1 As noted in paragraphs 2.22 et seq of the Objection, FWY believes that the potential employment benefits of the scheme have been overstated in the Planning Statement.

12.2 FWY does not believe the extremely limited improvements to accessibility and mobility that the LTVS would deliver could in any way generate the level of indirect employment asserted, whilst direct employment opportunities resulting from the scheme would be limited and many of them short term.

12.3 The TAS Report estimates that the employment opportunities generated by the operation and administration of the LTVS services would be approximately 105. However, FWY believes that the implementation of the services would put at least an equivalent number of jobs at risk at the bus companies running existing services on the corridor. At the same time, a further loss of jobs is likely as a result of the consequential reductions to the wider network.

12.4 The construction jobs generated by the project would of course be short-lived and could in any case be generated by other measures to improve the city's transport infrastructure.

12.5 Since it will be seen from the TAS Report that the number of people using the LTVS service has been significantly overstated, it follows that the economic benefits flowing from the implementation of the Order would be much lower than forecast by the Applicants.

12.6 Direct employment opportunities of a much greater magnitude could be created by the adoption of citywide measures to improve the operating environment of the bus network as proposed under the New Bus for Leeds. This would therefore encourage growth in the use of public transport throughout the city rather than just on two corridors.

12.7 By the adoption of technology for vehicles which are no longer in production in the UK, the proposal denies a locally located manufacturer the opportunity to take advantage of orders for new vehicles that would result from the LTVS proposals.

13 Ground 1i: Claims concerning economic benefits

13.1 At paragraphs 2.26 and 2.27 of the Objection, FWY sets out its view that the claimed 3% increase in output equivalent to an annual £176 million boost to the local economy is not robust.

13.2 As will be seen from the TAS Report at Appendix 2, the review of the 2012 PEBCS demonstrates that the proposed LTVS would derive its patronage from existing transport users. The Applicants' modelling work suggests that the system would not have the capacity to cope with a significant increase in peak flows, particularly northbound from the city centre in the evening. Without the provision of additional capacity, the system could not support the number of additional jobs quoted, either directly or indirectly. The system capacity is discussed further at section 5.7 of Appendix 2.

14 Ground 2: Modifications to the Applicants' proposals

14.1 In Section 3 of the Objection, FWY sets out its belief that, if contrary to and without prejudice to the objections set out above, the principle of the LTVS is accepted by the Inquiry, the proposals should be modified.

14.2 This needs to be seen in the context of FWY's strong belief, shared with the Applicants, that there needs to be an improved transport network in the city and the City Region. FWY is working to deliver this in partnership with local authorities throughout West Yorkshire.

14.3 In particular:

(a) FWY questions whether the current proposals are fit for purpose, provide the best distribution of benefits and represent the best value for money (Ground 2a);

(b) the New Bus for Leeds alongside proposed significant rail improvements would offer much greater value for money (Ground 2b);

(c) the proposed use of trolleybus technology should be changed and the system designed to integrate fully into the existing transport provision rather than overlaid on top of it (Ground 2c).

14.4 Each of these three issues is discussed in greater detail in sections 15, 16 and 17 below.

15 Ground 2a: Fitness for purpose of the Applicants' proposals

15.1 As was set out in section 2 of the Objection, and amplified in paragraphs 4 to 13 above, FWY does not believe that the LTVS would deliver the scale of benefits claimed by the Applicants in the Planning Statement. As a consequence, the proposals represent poor value for money.

15.2 As noted in section 7.3 of the TAS Report at Appendix 2, the proposals represent a poor strategic fit with the Applicants' transport strategy, reinforcing the view that the proposals represent poor value for money.

16 Ground 2b: Alternative proposals

16.1 Paragraph 4.8 of this document sets out FWY's proposals for the New Bus for Leeds as an alternative to the Applicants' proposals. FWY believes that this vision could be delivered more quickly, so that benefits could be delivered to passengers beginning within the next 18 months rather than waiting until 2019 at the earliest under the Applicants' proposals. Many of the benefits provided by multi-door vehicles and smart ticketing systems would be provided at FWY's risk and at no cost to the public purse. The New Bus for Leeds is the label to the improved developments which FWY would like to make. However the main thrust of FWY's case on alternatives is not restricted to the delivery of the New Bus for Leeds and may be applied to other bus based schemes for public transport improvement.

16.2 FWY's vision for the future encompasses a much wider cross-section of the current Leeds bus network, and accordingly the benefits would also be felt throughout the city instead of being confined to the two corridors along which the LTVS would be provided. The extent of the plans which FWY has to implement the New Bus for Leeds on other corridors in Leeds can be seen in Section 8 of Appendix 3 which envisages some 260 buses on up to 12 corridors.

16.3 Thus, the benefits of the New Bus for Leeds would be more widespread and felt more quickly than LTVS.

17 Ground 2c: Concerns regarding trolleybus technology

17.1 Paragraph 3.3 of the Objection sets out FWY's reasons for recommending strongly that the proposed use of trolleybus technology should be eliminated from the Applicants' proposals.

17.2 These reasons are summarised below:

(a) Value for money in capital costs:

(i) electrification infrastructure: costs arising from the installation of wiring, traction poles, sub-stations and the other equipment (estimated by FWY to cost in excess of £20 million) could be saved completely;

(ii) vehicles: because trolleybuses are no longer produced in large volumes, the capital costs of the vehicles will be much higher than conventional vehicles and supply will be limited to fewer manufacturers. FWY notes that the capital costs allowed in the PEBCS, after adjustment for inflation, would be £717,000 per vehicle - over three times the unit cost of equivalent diesel, gas or even hybrid powered vehicles. The limited use of trolley buses generally throughout the world and the need for a bespoke system for Leeds creates inherent weaknesses for the future robustness of the scheme particularly in respect of

the delays and higher costs associated with sourcing replacement vehicles etc. This is upon the assumption (which cannot be given) that a source of practical supply can be guaranteed to exist into the future;

(b) Value for money in operating costs: the on-going operational costs of the system are likely to be unnecessarily high as a consequence of:

(i) the need to maintain an expensive electrification infrastructure;

(ii) the requirement to obtain, and maintain a stock of, spare parts for a virtually unique fleet of no more than 20 vehicles of a type not in volume production;

(iii) the planned specification of conductors for the system in an age where pre-payment of fares via electronic means is rapidly becoming the norm;

(c) The system would run the risk of being obsolete before it opened and is not 'future proofed'. The rapid development of electric vehicle technology including induction charging of vehicle batteries at stops and termini (as currently being demonstrated in Milton Keynes), means that the adoption of 70 year old trolleybus technology is unnecessarily expensive;

(d) Inflexibility and unresponsive to market changes:

(i) whilst fleets of conventional vehicles can be moved from one location to another and cascaded onto less high profile services, the nature of the LTVS system means that the same vehicles would operate on the corridor for the full expected life of up to 30 years, becoming progressively less up to date and attractive to customers;

(ii) the high capital cost of providing extensions or diversions to trolleybus systems means that the LTVS would be much less flexible and therefore less responsive to the changing need of existing and future potential customers. The fact that vehicles of the type envisaged are not in rolling production would make the provision of small numbers of extra vehicles to cope with growth in demand prohibitively expensive to provide. Timescales could be significantly lengthened and the purchase would be subject to availability of public funding;

(e) Visual intrusion, environmental impact and operational vulnerability:

(i) The provision of overhead wires and the poles required to support them has a major impact on the urban environment. As it needs two wires, the supports are more visually intrusive than light rail, especially at junctions and on corners.

(ii) The particular nature of the route through Headingley means that the need to cut back and remove trees as a result of the need to keep them clear of overhead wires increases the environmental impact of the scheme unnecessarily;

(iii) Overhead wires can be vulnerable to damage from storms and high winds, so increasing the risk of perturbations and interruptions to services.

17.3 By contrast, the New Bus for Leeds would not raise such significant concerns because it retains the flexibility common to all bus-based systems and the visual impact on the quality of life in the corridor would be much lower.

18 Ground 3: Exclusion of FWY from the development of the proposals

18.1 As noted in Paragraph 4.4 of the Objection, FWY is the major provider of bus services in the city and region, and successor to many highly respected operators. As such, the Company has

extensive knowledge of the local market. It also employs many long service staff who have spent their working careers serving the population.

18.2 The company is disappointed that the Applicants did not call more fully upon this expertise in formulating the LTVS proposals, relying instead on a process which has led to the flawed Business Case discussed in this Statement of Case. This means that the LTVS proposals have been developed without taking advantage of the substantial evidence available about the current and projected market from existing operators.

18.3 FWY remains willing to share this knowledge to ensure the best outcome for the people of Leeds and the surrounding area. The New Bus for Leeds represents a far better public transport solution for Leeds and the City Region. However, should the Order be granted, and the Applicants' proposals implemented, FWY takes the view that there needs to be a full and transparent procurement exercise to ensure the most effective manager and operator is selected. FWY stands ready to participate in such a process.

19 Summary

19.1 For the reasons set out in this statement of case, the LTVS as proposed is unlikely to be necessary and is unlikely to deliver the benefits claimed. The LTVS represents poor value for money and the New Bus for Leeds would deliver similar benefits at less cost. In short, there is no compelling case in the public interest which should persuade the Inquiry that the scheme should proceed and that it justifies the acquisition of property by compulsory purchase.

19.2 Without prejudice to its in principle objections, should the Inspector and Secretary of State be persuaded that the LTVS should proceed, FWY maintains that the LTVS should be modified to reflect the concerns set out in this statement of case. FWY should also be much more closely involved in the future operation of any consented LTVS as part of the ongoing public transport partnership arrangements for the benefit of the city and wider City Region.

GREGORY JONES QC AND KING & WOOD MALLESONS SJ BERWIN
ON BEHALF OF FIRST WEST YORKSHIRE LIMITED

30 January 2014

APPENDIX 1

First West Yorkshire Limited Objection

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Our Ref: DBA/KG

29 October 2013

Secretary of State for Transport
Department for Transport
c/o TWA Orders Unit
Zone 1/18
Great Minster House
33 Horseferry Road
London
SW1P 4DR

Dear Sir

Transport and Works Act 1992
The Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006 - The Leeds Trolley Vehicle System Order

Please find enclosed the objections on behalf of First West Yorkshire Limited in relation to the Leeds Trolley Vehicle System Transport and Works Act Order.

The objections are self-explanatory. Any requests for further information, notices or any other document required to be served on First West Yorkshire Limited as objectors to the Order should be sent to SJ Berwin LLP, 10 Queen Street Place, London EC4R 1BE (ref: Stephen Webb).

Yours faithfully

Dave Alexander
First West Yorkshire Limited

Encs.

cpt member ATOC UITP Member membre Mitglied THE OUTWARD BOUND TRUST

LEEDS TROLLEY VEHICULAR SYSTEM TRANSPORT AND WORKS ACT ORDER

OBJECTION ON BEHALF OF FIRST WEST YORKSHIRE LIMITED

1 Background

1.1 This objection is made by First West Yorkshire Limited ("FWY") in relation to the Leeds Trolley Vehicular System and Works Act Order ("LTVS TWAO") proposals that were published in September 2013.

1.2 In July 2012 the Department for Transport confirmed the Leeds New Generation Transport Scheme's programme entry status and that £173 million of Government funding was available for the £250 million scheme. It was also confirmed that in order to authorise the construction, operation and maintenance of the system, an application should be submitted for an order under the Transport and Works Act 1992. This application was submitted on 19 September 2013.

1.3 The application is being promoted by Metro and Leeds City Council. In addition, a request for a direction as to deemed planning permission has also been submitted to the Secretary of State under Section 19(2A) of the Town and Country Planning Act 1990. It is proposed that the layout, scale, appearance, access and landscaping of the trolley vehicle system should be subject to the subsequent approval by the local authority to the extent and in the manner set out in conditions to the direction.

1.4 A number of applications for conservation area consents and listed building consents have also been submitted in respect of the works proposed to be undertaken along the route as part of the overall scheme.

1.5 As part of the main application documents, New Generation Transport have published a planning statement ("the Planning Statement") dated September 2013 (document reference A/01/6). This Planning Statement outlines and summarises how they intend to address planning matters and issues related to the LTVS TWAO and it provides:

(a) A description of the scheme including objectives and benefits and route alignment;

(b) A summary of the Transport and Works Act Order process;

(c) The European, national, regional and local policy context for the scheme;

(d) The benefit for which planning (and related heritage applications) would be sought.

1.6 The Planning Statement seeks to set out the key planning considerations of the scheme, and it highlights those issues raised relevant to the planning process.

1.7 FWY is a major bus operator throughout the whole of West Yorkshire and most importantly in the Leeds area. It is therefore well placed to comment on the Planning Statement and the likelihood of success of the proposed trolley bus scheme and its associated direct impact on the existing bus network provision in both Leeds and the wider City Region.

1.8 FWY has reviewed the Planning Statement and considered the proposed benefits of the Leeds trolley bus scheme. Based on the information provided FWY believes that the trolley bus scheme in its current form may not deliver the benefits as set out in the Planning Statement nor offer value for money for the tax payer and end user. Crucially FWY is of the view that the scheme needs to be "future proofed" and that there are important questions around the analysis of the models provided.

1.9 FWY wishes to work with Leeds City Council to deliver a modern transport system for Leeds and the wider City Region that offers value for money and has been future proofed taking into account future advancements in technology. The following grounds for objection are therefore intended to be constructive and as helpful as possible.

2 Ground 1: It is questionable whether the LTVS as proposed delivers value for money and whether it is indeed necessary. There are more cost effective ways of improving transport provisions throughout Leeds by investing in bus and rail infrastructure.

2.1 It is FWY's view that despite the claim of significant benefits to passengers, the LTVS is likely to result in a two tier public transport system in Leeds to the significant detriment of existing bus services in Leeds and the wider West Yorkshire area.

2.2 The resulting redistribution of passenger services is likely to lead to a number of outlying areas in the city being disconnected from the public transport network or see a reduction in the breadth and frequency of service. The claimed benefits set out in the Planning Statement can equally be delivered by a radical new approach to the provision of bus and rail services and bus and rail infrastructure, spreading benefits more widely across the city more quickly and more effectively.

2.3 It is FWY's view that the money earmarked for the project could be more effectively used for investment in improved and future conventional systems for bus and rail services.

2.4 The Planning Statement makes a number of claims that the LTVS will deliver the following benefits:

(a) A reduction in public transport journey times, particularly at peak travel times;

(b) Improving the journey time punctuality coupled with high frequency services from early morning to late in the night;

(c) High quality stops with shelters and real time information offering level boarding to the vehicle;

(d) Park and ride sites at key locations attractive to city bound traffic;

(e) Modern passenger vehicles offering improved quality of travel;

(f) Linkages to north and south Leeds making it easier for people to travel to work and improved access to key destinations across the route;

(g) Reduction in congestion levels and improvements in air quality;

(h) The potential to create 4,000 jobs in construction, ancillary services and by linking people to employment opportunities and encouraging inward investment to the city; and

(i) A forecast 3% increase in output equivalent to a £176 million boost to the local economy.

2.5 Taking each of those in turn we review and comment on each of these issues.

Reduction in public transport journey times, particularly at peak time travel

2.6 It is FWY's view that the forecast reduction in public transport journey times particularly at peak periods through the provision of LTVS is questionable for three reasons:

(a) The precise impact of the priority measures on other traffic and on traffic crossing the NGT route is extremely difficult to model accurately, and FWY do not believe that the authorities could guarantee to deliver the LTVS journey times they have assumed in their model in the planning statement;

(b) There is a risk that by increasing the delays to other traffic either using the same route as NGT or crossing the alignment, the journey times of other bus services running alongside and intersecting the NGT alignment will be increased thereby offsetting any gains in travel journey times by passengers using the service. This would potentially increase journey times for users of those services, producing an economic disbenefit, as well as adding costs of operation to the network which bus operators would have to pass on to customers as the end users; and

(c) Passengers using the bus service which run along the NGT alignment, at a frequency of 10 minutes (or high frequency) but serve other parts of the city are likely to experience a reduction in frequency as a result of the abstraction of patronage by NGT on the core sections of the route. This will increase the amount of time these passengers wait at the stop so increasing their overall journey time and make the offered level of service less attractive and convenient. This would offset some of the claimed economic benefits of the LTVS scheme.

Improvements in journey time punctuality

2.7 FWY already provides high frequency services from early morning to late at night. We do not therefore accept that the LTVS will deliver improvements in this regard. As already noted, claimed improvements in punctuality are difficult to prove, and in any case may only be delivered by making existing public transport services less attractive.

2.8 From the analysis of delays which occur on existing services it may well be possible that cheaper, more effective amendments could be made to the existing highway infrastructure to deliver the same benefits with buses operating along Headingly Lane increased from 20 per hour to 24 per hour. The existing bus services offer frequent services from 06:30 to 18:30. The times and frequencies are kept under review in order to generate maximum demand and were last extended/increased in January 2013 with further planned for December 2013.

High quality stops with shelters and real time information offering level boarding to the vehicle

2.9 It is not necessary to build a trolley bus system in order to achieve improvements to the quality of the environment or facilities at bus stops.

2.10 Level boarding at stops is not a function of the proposed trolley system, and would require some form of guidance to be achieved successfully by the proposed vehicles in the same way as some conventional buses.

2.11 FWY believes that the same benefits could be achieved for conventional buses, for example by way of kerb guidance for buses as has been operated elsewhere in Leeds for over 20 years. In short, these benefits can be achieved without the LTVS.

Park and ride sites at key locations attractive to city bound traffic

2.12 FWY strongly believes in the concept of park and ride services and networks and indeed First Bus in the UK operates over 16 services on bus based park and ride services throughout the UK including the successful site on King Lane in Leeds.

2.13 As such, FWY would strongly support proposals to construct and operate park and ride sites at Stourton and Boddington which conventional bus services could serve.

2.14 However, a trolley bus system is not required to deliver successful park and ride services. Attention here is drawn to the proposals in York for an electric bus service serving Poppleton and possibly Monks Cross without the need for a trolley bus service.

2.15 ***Modern passenger vehicles offering improved quality of travel***

2.16 The fleet of vehicles currently operating bus services on the NGT corridor have an average age of three years. All operate with air suspension and the latest technological advancements to provide the best available ride quality to our customers, subject of course to the smoothness and evenness of the road surface upon which they travel.

2.17 The vehicles proposed for the LTVS are a similar design with identical wheels and suspension systems to a conventional diesel, hybrid or battery powered bus. As noted, ride quality is a function of vehicle design and road surface quality, and we do not therefore accept the assertion that LTVS would of itself improve the quality of travel in a way that could not be delivered for existing bus services on the corridor. In order to provide the peak capacity on the proposed design of a single articulated trolley vehicle, it is inevitable that the ratio of seats to standing spaces would be lower than on a conventional bus, so offering a reduced standard of comfort and safety for passengers, particularly older customers with restricted mobility.

Linkages

2.18 It is asserted in the Planning Statement that linkages to north and south of Leeds would be made easier for people to travel to work and improved access to key destinations would be made across the route.

2.19 There is a real risk that current extensive cross city links could be jeopardised by the LTVS proposals. Cross city services (including LTVS) are notoriously subject to reliability issues resulting from congestion, which could be worsened by the proposed scheme. This would lengthen customers' journey times, potentially leading to reduced demand, so threatening the viability of some services. At the same time, existing bus services on the LTVS corridor would be reduced, so making linkages to parts of the city not served by LTVS less frequent, less attractive and so also threatening their viability. Further Cross City services and links can be introduced if additional priorities were to exist.

Reductions in congestion and improvements to air quality

2.20 After reviewing the 2012 Business Case, we have grave doubts about the forecast of the number of car drivers switching their journeys to LTVS, and therefore do not accept that the scheme would deliver a significant reduction in congestion. At the same time, reduction of bus services on the corridor to areas not served by LTVS risks a modal switch back from bus to car by residents of those areas if these people choose to drive.

2.21 FWY do not believe that the relatively small reduction in car traffic promoted by the LTVS would make a significant contribution to air quality in the city. We believe that a much more significant improvement in air quality across the whole city could be achieved by the introduction of hybrid, electric or gas powered buses (especially as PTE/LCC consider that much of the pollution comes from buses) across the whole network. FWY is already committed to this and keen to do it as soon as suitable vehicles are available with the right level of reliability. Similarly, air quality improvements could be delivered if the appropriate level of priority is provided for bus services to ensure any inefficiencies in the deployment of these vehicles on the network can be eliminated.

4,000 new jobs

2.22 FWY believe that the potential employment benefits of the scheme have been overstated in the Planning Statement. FWY does not believe the extremely limited improvements to accessibility and mobility that the LTVS would deliver could in any way generate the level of indirect employment asserted, whilst direct employment opportunities resulting from the scheme would be limited and many of them short term.

2.23 The estimated direct employment opportunities from the operation and administration of the LTVS would be around 105 jobs and would put at least an equivalent number of jobs at risk at the bus companies running services on the corridor. Further loss of jobs is likely as a result of the consequential reductions to the wider network. The construction jobs would of course be short-lived and could in any case be generated by other measures to improve the city's transport infrastructure.

2.24 It is FWY's view that direct employment opportunities of a much greater magnitude could be created by the adoption of citywide measures to improve the operating environment of the bus network and therefore encourage growth in the use of public transport throughout the network rather than just on one corridor.

2.25 By the adoption of technology for vehicles which are no longer in production in the UK, the proposal denies a UK based manufacturer the opportunity to take advantage of orders for new vehicles that would result from the LTVS proposals.

2.26 FWY has grave doubts about the economic benefits that would be generated from the system, and questions whether the extremely limited improvements to accessibility that the LTVS would deliver could in any way lead to the level of indirect employment asserted.

A 3% forecast increase in output equivalent to £176 million boost to the local economy

2.27 The claimed 3% increase in output equivalent to an annual £176 million boost to the local economy is not robust. In any event, an equivalent or greater level of benefit to that derived from the LTVS could flow from investment in the existing bus and rail network. In the Business Case documents available, the LTVS derives its patronage from existing transport users and does not have the capacity to cope with a significant increase in peak flows, particularly northbound from the city centre. This would not therefore support the number of additional jobs quoted, either directly or indirectly.

2.28 Without those jobs the forecast levels of output would not be delivered.

3 Ground 2: If the principle of the LTVS is accepted, then it should be modified.

3.1 FWY believes that there does need to be an improved public transport network in the City and the City Region and is working to deliver this in partnership with local authorities throughout West Yorkshire. As part of this, infrastructure for public transport services in Leeds needs to be improved.

3.2 However, as stated above, FWY question whether the current proposals are fit for purpose, provide the best distribution of benefits and represent the best value for money. An alternative proposal for a bus-based rapid transit system alongside significant rail improvements and in the longer term, a train-tram system would enhance the offer over and above that currently on the table. In particular, the proposed technology should be changed and the system designed to integrate fully into the existing transport provision rather than overlaid on top of it. Such changes would not only be cheaper but passengers would gain some of the benefit within the next 18 months to 2 years with most coming well before the anticipated launch of the trolleybus in 2018 at the earliest. The benefits would also be felt not just across Leeds, but the whole City Region instead of being confined to the one corridor that will benefit from NGT.

3.3 There are several grounds for suggesting that the present proposals may not be fit for purpose including:

(a) Value for money and capital expenditure: The construction costs of the scheme are inflated unnecessarily by the proposals to provide electrification by wires. This will require expensive infrastructure in the form of substations, poles and wires requiring additional land take and higher construction costs. In addition, because trolley buses are no longer produced in large volumes, the capital costs of the vehicles will be much higher than conventional vehicles; supply will be limited to fewer manufacturers and the vehicles

will be expensive to maintain as they get older. Value for money in operating costs: The on-going operational costs of the system are likely to be unnecessarily high as a consequence of (i) the need to maintain an expensive electrification infrastructure and (ii) the requirement to maintain and obtain spare parts for a virtually unique fleet of no more than 20 vehicles and (iii) the planned specification of conductors for the system in an age where pre-payment of fares via electronic means is rapidly becoming the norm.

(b) The propulsion system is not future proofed: In FWY's view, the rapid development of electric vehicle technology including induction charging of vehicle batteries at stops and termini, means that the adoption of 70 year old trolley bus technology is unnecessarily expensive. There is also a clear risk of the LTVS system becoming obsolete before it opens. During the last 10 years there has been a rapid development of vehicle propulsion technology which has been evidenced through the introduction of hybrid, natural gas, hydrogen and fully electric vehicles. Potentially the scheme as proposed will lock Leeds and West Yorkshire into having to support more expensive, out-dated technology well into the future and prevent them from benefiting from future technological advancements.

(c) Inflexibility of vehicle technology: Whilst fleets of conventional vehicles can be moved from one location to another and cascaded onto less high profile services, the nature of the LTVS system means that the same vehicles would operate on the corridor for the full expected life of up to 30 years, becoming progressively less up to date and attractive to customers and less flexible to provide for frequency increases.

(d) Unresponsive to market changes: The high capital cost of providing extensions or diversions means that the system would be much less flexible and therefore less responsive to the changing needs of existing and future potential customers. The fact that vehicles of the type envisaged are not in rolling production would make the provision of small numbers of extra vehicles to cope with the growth in demand impossibly expensive to provide, and the timescales could be significantly lengthened.

4 Ground 3: FWY is best placed to understand local demand but has not been involved with the planning and potential operation of the LTVS.

4.1 There is a need to ensure that the LTVS TWAO not only delivers the physical infrastructure but also sets the context for a system which, if approved, is properly managed and operated.

4.2 As the major provider of bus services in Leeds and the city region and successor to many highly respected operators, FWY has extensive knowledge of the local market. It also employs many long service staff who have spent their working careers in serving the population. Despite this extensive knowledge and experience, to date FWY has not been involved in bringing the LTVS plans forward.

4.3 FWY has concerns about the process through which the proposals have been developed including the failure to take advantage of the substantial evidence available about the current and projected

market from existing operators. FWY takes the view that there needs to be a full and transparent procurement exercise to ensure the most effective manager and operator is selected should the scheme proceed.

4.4 FWY remains willing to share its knowledge and experience and wishes to work with Metro and Leeds City Council to ensure the best outcome for the people of Leeds and the surrounding area.

5 Summary

5.1 FWY is willing and able to assist Metro and Leeds City Council in preparing a scheme that will deliver significant public transport improvements for the people of Leeds and which meets the shared aspirations of the City to benefit from a European leading public transport system. However, FWY does not believe that this should necessarily be the delivery of the LTVS. There are alternative initiatives which can bring about the same public transport benefits for less cost and which are equally extendable throughout Leeds and West Yorkshire. FWY is prepared to share its knowledge and experience and to work in partnership to ensure that a robust, future proofed, value for money transport solution for Leeds is delivered.

30 October 2013

Further correspondence should be sent to:

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10 Queen Street Place
London
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APPENDIX 2

The TAS Report

Leeds New Generation Transport: Review of the 2012 Business Case

FirstGroup plc
50029

January 14

Final Report

TAS

The TAS Partnership Limited
Passenger Transport Specialists

Quality Assurance

Document Management

Document Title	Leeds New Generation Transport: Review of the 2012 Business Case		
Name of File	50029-2013 Business Case Review		
Last Revision Saved On	29/01/2014 15:10:00		
Version	1	2	
Prepared by	CC	CC	
Checked by		AG	
Approved by		AG/CC	
Issue Date	21/01/2014	29/01/14	

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Consequently, The TAS Partnership Limited will expect to be consulted before any content of this document is released under a Freedom of Information request.

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Executive Summary

1. Project Overview

1.1 This report reviews in some detail the business case for the New Generation Transport project promoted by West Yorkshire Integrated Transport Authority and Leeds City Council

1.2 The project would deliver a 14 kilometre trolleybus scheme linking Holt Park in the north west suburbs with Stourton to the south east.

1.3 Park & Ride facilities would be provided at Bodington (800 spaces) in the north west, and Stourton (1,500 spaces) to the south east.

1.4 56% of the route would offer some form of segregation from general traffic, with 6.1km being new alignment.

2. Operations

2.1 The line will operate every six minutes (10 vehicles per hour) in each direction between Stourton and Bodington, with every alternate vehicle continuing to Holt Park.

2.2 The system is assumed to have a fleet requirement of 19 vehicles, and these are envisaged to be of single deck, single-articulated design. The vehicles will also carry a conductor.

2.3 A new depot would be required and is likely to be built adjacent to railway land in the Hunslet area.

3. Costs

3.1 Capital cost is estimated by the promoters at £250.7m (2012 prices).

3.2 The promoters report that £16.9m of this will be needed for electrification infrastructure. Vehicles are expected to cost £11.4m (2008 prices). After allowing for inflation to 2012 prices, we estimate a unit cost of £0.72m each (at 2012 prices) – at least 2½ times the equivalent diesel-powered vehicle.

3.3 TAS estimates that annual NGT operating costs before depreciation and finance charges would be around £6m per annum.

4. Patronage Forecast

4.1 The promoters expect that NGT would carry 11.8m passengers per annum, of which almost 72% would transfer from existing bus services.

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4.2 Analysis of the pattern of forecast demand suggests that the planned frequency would not be sufficient to carry the forecast loads during the evening peak.

4.3 TAS believes that this forecast is overstated by approximately 50%, and in particular that:

- Annualisation factors used to convert single hour forecasts to annual ones were inappropriate and should be altered.
- There has been a reduction of between up to 16% in road traffic on the corridors since the model was built in 2007/08
- The existing bus demand from which transfers have been calculated is overstated

4.4 On this basis, we estimate that a more accurate figure would be 5.9m passengers per annum.

5. Corridor Market Profile

5.1 NGT would serve a resident population of 45,473 within a 400 metre buffer of the route, of whom 47.2% reside in no car households. 9.9% of the corridor population was over 60 in 2011, and 10.6% was under 16.

5.2 Overall we estimate that the corridor population is likely to generate some 8.2m passenger journeys per annum based on average trip rates derived from the DfT National Travel Survey.

6. Existing Bus Patronage on the Corridor

6.1 We estimate that in 2013 the demand on the corridor to be served by NGT was of the order of five million trips, 3.4 million less than the promoters assume will switch to NGT.

6.2 The introduction of NGT would result in poorer services for some 700,000 existing bus passengers and put at risk the commercial viability of services used by a further 1.9 million.

7. Strategic Fit

7.1 We find that NGT is a relatively poor fit with the promoters' own stated strategic goals, and consider that the NGT scheme will have little or no effect on the achievement of the promoters' Local Transport Plan objectives.

7.2 We believe that too many of the choices made in designing and promoting the scheme are designed to assert public sector control over the transport system in Leeds rather than deliver benefits for customers and potential customers.

8. Choice of Mode

8.1 We have reviewed the explanation contained in the PEBCS of the choice of trolleybus over other alternatives, and find it unconvincing.

8.2 We believe that the choice of trolleybus technology:

- increases the capital costs of the project unnecessarily by requiring expensive overheads and vehicles that cost between 2 and 2½ times the equivalent diesel or hybrid vehicle
- would be difficult to extend and/or reroute
- would result in a system that was inflexible and unable to respond to future changes in demand and in customer expectations
- would reduce the quality of life in requiring visually intrusive overhead wiring and supports
- would risk rendering the system permanently and unnecessarily reliable on public funds for future extension, maintenance and asset management

9. Evaluation of Alternatives

9.1 The scoping of the Next Best Alternative and the Low Cost Alterative is in our view seriously flawed and designed to flatter the promoters' preferred scheme.

9.2 In particular, we highlight the removal of the sections of segregated alignment from the Next Best Alternative as being incorrect: we do not believe that these would be undeliverable without the trolleybus option.

10. Project Delivery

10.1 The proposed method of project delivery would leave the public sector promoters exposed to key project and financial risks.

10.2 In particular, the splitting of the project delivery and construction contracts would expose the promoters to systems integration risks.

10.3 The plan to retain revenue risk for the scheme in the public sector is considered inappropriate in current financial circumstances, especially given the high degree of uncertainty this review has identified in the patronage and revenue forecasts.

10.4 Failure to provide for depreciation in the operating cost estimates would mean that no provision would be made for vehicle replacement/refurbishment, thus making the project reliant on future public sector funding

Introduction and Objectives 1

1.1 Introduction

1.1.1 The New Generation Transport (NGT) proposal for Leeds is a trolleybus system originally intended to run along three corridors to and from the city centre, linked by a loop around the public transport 'box' that serves the various elements contained within the city's central business district.

1.1.2 The scheme would be constructed in phases, and the Government has granted provisional funding approval ("Programme Entry Approval") for Phase One. A draft Transport & Works Act Order seeking construction powers for the project was submitted on 17 September 2013.

1.1.3 The TAS Partnership has been invited to review the current business case for the scheme and to submit its advice to FirstGroup plc as if the company was bidding for a contract or franchise to design, build, operate and maintain the system.

1.2 Why TAS

1.2.1 The review of business cases and other work on rapid transit schemes – many of which have gone on to be successfully implemented – has been a major feature of our work at The TAS Partnership for 20 years.

1.2.2 This experience is summarised in the two tables which follow.

TAS Experience of Light Rail Projects since 1995

Project	Clients	Remarks
Bristol LRT	CityLink Consortium and FirstGroup plc	Business case evaulation
Croydon Tramlink	Tramtrack Croydon (CentreWest, 3I, Bombardier, Sir Robert MacAlpine, Amey Construction, RBS)	Patronage/revenue case in bid for Design Build Operate and Maintain franchise (for the winning consortium)
Docklands Light Railway	Go-Ahead Group and Keolis	Operating franchise bid
Dublin LUAS	FirstGroup plc	Operating contract bid
Edinburgh Tram	FirstGroup plc	Operating contract bid
Edinburgh Tram	Transdev	Evaluation of final business case for client as operator of the proposed system.

Project	Clients	Remarks
Leeds Supertram	Momentis Consortium (Bombardier, FirstGroup, Bouygues, Jarvis)	Jointly with Halcrow. Patronage/revenue case in bid for Design Build Operate and Maintain franchise
Merseytram	Siemens and Arriva	Patronage/revenue case in bid for Design Build Operate and Maintain franchise (pre-qualification only)
Manchester Metrolink	Greater Manchester PTE and Altram (Manchester)	Phase One Capacity Study, joint with Maunsell
Manchester Metrolink DBOM	GMRT Co (Bombardier, FirstGroup and AMEC)	Jointly with Arup. Patronage/revenue case in bid for Design Build Operate and Maintain franchise ("Phase III" bid)
Nottingham Express Transit	Arrow Consortium (Transdev, NCT, Bombardier, Carillion, Innisfree)	Patronage/revenue case in bid for Design Build Finance and Operate franchise. (the winning consortium - who maintained our appointment through until after opening). In 2010, their successors appointed TAS as sole advisers on their bid for the new DBFO contract covering Phase 2 of the NET project.
Sheffield Supertram	FirstGroup and Mainline Group	Privatisation process
South Hampshire LRT	FirstGroup	Business case evaluation, after which client decided not to bid
Yarra Trams Privatisation, Melbourne	MetroLink consortium, comprising Egis Projects, Transfield and Transdev	The winning consortium which held the contract for over a decade

Table 1: TAS Involvement in Guided Bus Projects since 1995

Project	Clients	Remarks
Coventry	Coventry City Council, CENTRO and local bus operators	Ongoing work on the development of BRT corridors in the city
Crawley/Gatwick/Horley	West Sussex County Council, BAA plc and partners	Pre-feasibility study
	Metrobus (Go-Ahead Group)	Implementation of new services and agreement with promoters
Cleveland	Tees Valley Partnership	Street Transit Feasibility Study, jointly with Arup
East Lancashire	East Lancashire Partnership (Lancs CC and Blackburn Council)	Street Transit Feasibility Study, jointly with Arup

Project	Clients	Remarks
Edinburgh	ConCERT consortium, comprising FirstGroup and Balfour Beatty	Patronage/revenue case in bid for Design Build Operate and Maintain franchise – the CERT guided busway scheme
Kent Thameside Fast Track	Blue Circle	Pre-feasibility and development work
Leeds Guided Busway	FirstGroup	East Leeds guideway appraisal
Luton Translink	Arriva	Business case evaluation and network design
Manchester-Leigh-Salford Busway	Greater Manchester PTE	Feasibility and implementation
	FirstGroup	Support and modelling for an initial bid (successful in leading to our client being selected for the second round)

1.3 Objectives

1.3.1 Our objectives in this initial overview of the Business Case have been to:

- understand the strategic approach taken by the promoters
- follow the logic of the route and mode choices taken
- appreciate the stated reasons for the decisions made
- gain an understanding of how the business case for the scheme has been put together
- undertake analysis of the existing market and the provision made to serve it.

1.4 Our Approach

1.4.1 We have reviewed the documentation provided by the promoters on the NGT web site, and tracked the evolution of the project since its first Major Scheme Business Case (MSBC) presented to the Department for Transport in 2009.

1.4.2 Our primary focus has been on – and references in this report refer to – the *Programme Entry Business Case Submission* ("**PEBCS**") dated 30 March 2012. This was the document which enabled the project to achieve "programme entry status", indicating DfT support for the project, sufficient to permit the promoters to go forward to the next stage, being the preparation of the draft order now submitted under the Transport & Works Act 1992, seeking construction powers for the project.

1.4.3 In evaluating the financial and patronage elements of the business case, our approach has been to follow the methodology which we routinely adopt in bid situations:

- to disaggregate the forecasts provided
- to evaluate the assumptions which underlie those forecasts, recommending any changes in the assumptions or further work to quantify alternative views
- We have provided a view as to the likely effect of any changes, though at this stage not provided an alternative forecast.

1.5 Report Structure

1.5.1 Chapter 2 of the report provides an overview of the project, and considers the capital and operating costs.

1.5.2 Chapter 3 provides a commentary on the patronage forecasting process.

1.5.3 Chapter 4 provides some market analysis of the corridors that would be served by NGT.

1.5.4 The analysis of existing bus demand undertaken is discussed in Chapter 5, and revenue estimates are provided in Chapter 6.

1.5.5 Chapter 7 offers some commentary on the strategic case made by the promoters and presents our assessment of the fit between the objectives and the proposals.

1.5.6 Finally, chapter 8 offers some conclusions about the NGT Business Case.

Project Overview 2

2.1 Overview

2.1.1 The basic proposal in the PEBCS is for a 14 kilometre trolleybus scheme linking Holt Park in the north west suburbs of the city with Stourton immediately to the south east of the city, providing park and ride facilities at two sites:

- Bodington in the north west, with 800 spaces
- Stourton to the south east with up to 2,300 spaces (1,700 at opening).

2.1.2 Of the 14kms, 56% would offer some form of segregation from general traffic, with 6.1km being new NGT-only route. Elsewhere, other priority measures will be provided to ensure "adequate levels of reliability".

2.1.3 A planned line to the east of the city and construction of a city centre loop for the system have both been removed from the current proposals but remain an aspiration for a future phase.

2.1.4 A diagram of the route showing the proposed stops can be seen at Figure A overleaf.

2.2 Segregation Provided

2.2.1 Within the overall proposal, the sections of segregated alignment are set out below. Guidance is not currently envisaged, and it is anticipated that the entire segregated route would be restricted to NGT only, leaving existing bus services on the adjacent highway. The on-highway measures would however be available for use by parallel bus services.

2.2.2 On the north route, limited segregation would be provided on the following sections of route:

- Alongside the eastern side of Millennium Square and along Cookridge Street
- Behind (i.e. to the east of) the Headingley District Centre
- Along the central reservation of the A660 dual carriageway immediately to each side of the roundabout at the junction of the A660 with the A6120 outer ring road.

2.2.3 On the south route, a much greater degree of segregation is proposed:

- Across the Tetley Brewery site, alongside Clarence Dock and thence to South Accommodation Road

2.2.4 Previous proposals for a segregated alignment between Balm Road and Wakefield Road (alongside the Hallam & Pontefract railway corridor) on the approaches to the Stourton park and ride site have been removed from the scheme as now proposed. That alignment is now expected to form part of the HS2 railway project.

2.3 Proposed Operation

2.3.1 The line will operate every six minutes (10 vehicles per hour) in each direction between Stourton and Bodington, with every alternate vehicle continuing to Holt Park.

2.3.2 The system is assumed to have a fleet requirement of 19 vehicles, and these are envisaged to be of single deck, single-articulated design. It is expected that the vehicles will also carry a conductor.

2.3.3 The running time components have been modelled as shown in Table 2 below. Unfortunately, the modelled work on run times in the City Centre is not reported in PEBCS, and has not been traced to a published document. We have therefore assumed a time based on existing bus running times.

2.3.4 This will be changed by the proposed re-routing via the Belle Isle estate, but we have yet to see the result of this on run times.

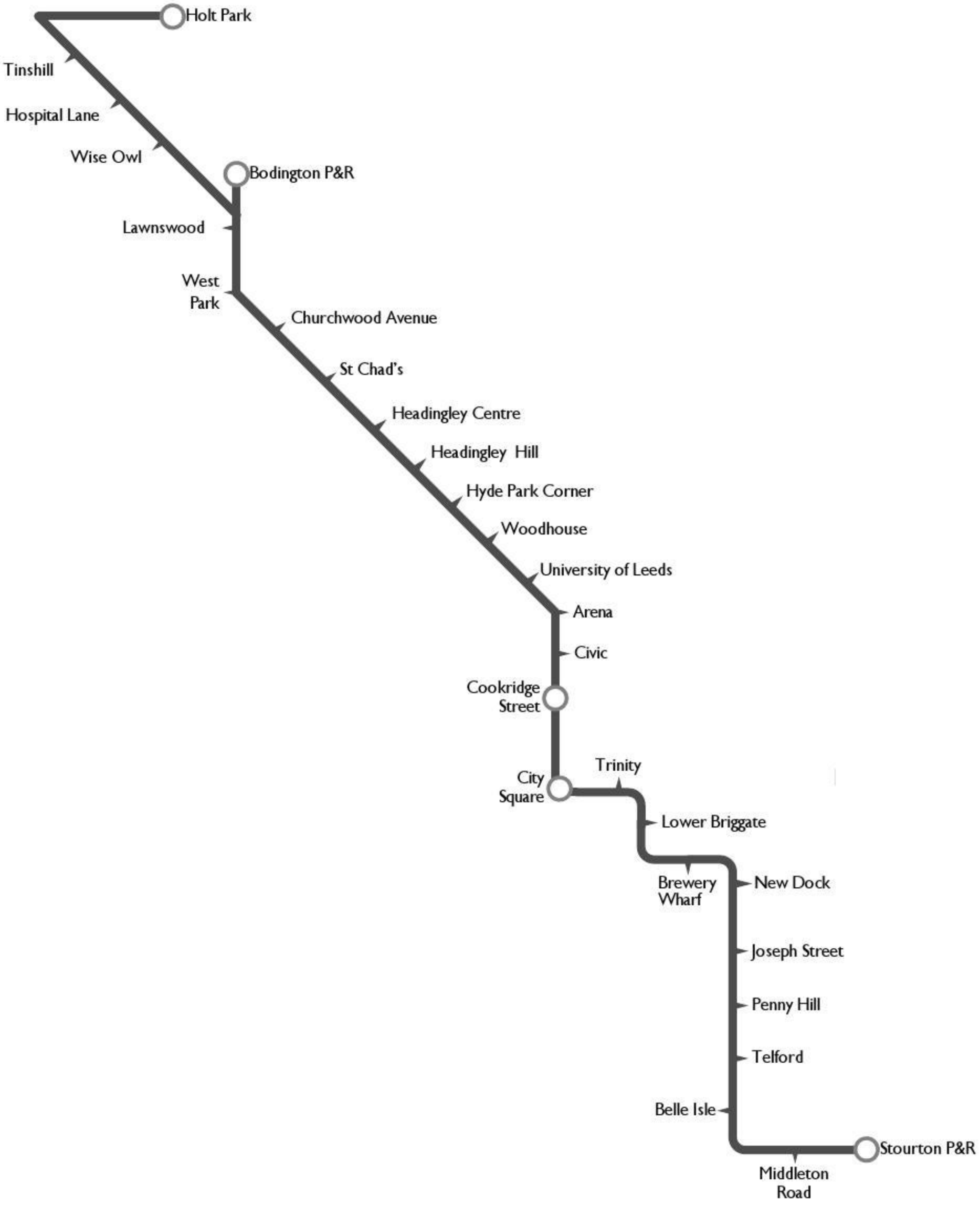
Table 2: NGT Assumed Running Times

	NGT Northbound	NGT Southbound	TAS Northbound	TAS Soutbound	Current Bus
Holt Park to Cookridge Street	27m 51s	27m 51s	28	28	34
Cookridge Street to Lower Briggate	N/A	N/A	9	9	9
Lower Briggate to Stourton	10m 35s	8m 35s	11	9	18
Total			48	46	61

2.3.5 On the basis of the previous routing via Balm Road, this would have given a cycle time of 94 minutes on Holt Park to Holt Park, allowing for recovery time of twelve minutes on a twelve minute frequency. On the journeys that turn short in the north at Bodington, the cycle time would be 74 minutes, allowing a ten minute recovery on a twelve minute frequency.

2.3.6 The PVR would therefore have been 16 vehicles, allowing three spare in the planned fleet of 19.

Figure A: The Proposed NGT System



2.4 Capital Costs

2.4.1 The overall capital cost of the scheme is estimated at £250.7m, as broken down in Table 3 below.

Table 3: Construction Cost Breakdown[1]

Item	£m (2008 Prices)
General and Scheme Costs	
Land acquisition	26.90
Earthworks/landscaping	8.50
Professional fees	32.71
Construction set up	18.88
Sub-total	**86.99**
Infrastructure Costs	
Tunnels and bridges	4.25
Highway works, including service diversions	42.06
Permanent way and other supporting/guiding structures	2.46
Workshops, depots stations and other buildings	13.80
Electrical plant and equipment	16.86
Signalling and communications	3.48
Vehicles	11.40
Other work	1.30
Risk and Inflation to 2012 prices	68.10
Sub-Total	**163.69**
	-
Total costs	**250.69**

2.4.2 The allowance of £11.4m for the vehicles would imply a unit cost allowance of £0.6m each (at 2008 prices) – at least 2½ times the equivalent diesel-powered vehicle. Applying the inflation factor shown in Line 7 Table 3 to individual components suggests that the vehicle cost at 2012 prices would mean a total cost for vehicles of £13.64m, a unit cost of £0.72m.

2.4.3 It might be expected that the cost saving for a conventional scheme integrated with existing transport provision would save the cost of electrification (£16.9m), the workshops and depot (£13.8m) and the vehicle costs (which would be funded by the private sector (£11.4m). This would be a total of £42.1m. However, it could be expected that other savings, such as land acquisition and lower fees, would result.

[1] *These figures taken from the Estimate of Costs tabled with the TWAO Application in September 2013 (Ref TWAO Document Ref. A-01-11).*

2.5 Operating Costs

2.5.1 There is no detailed breakdown of the operating costs in PEBCS, only a table showing that the costs of operation would be £9.1m in fiscal year 2020/21, against which are netted £4.2m of operating costs 'saved' by parallel reductions in the bus network.

2.5.2 On the basis of the specification outlined in the PEBCS, we estimate that the components of the system would be approximately 25,300 bus hours per year, covering just over one million kilometres. Manpower requirements would be of the order 56 drivers, 56 conductors (assuming these are required during all operating hours), and up to 37 maintenance, supervisory and management staff. Unit labour costs have been taken from 2011/12 FirstGroup figures in Leeds.

2.5.3 On this basis, we would estimate annual direct running costs to be of the order of £5.1m per annum before depreciation and finance costs.

2.5.4 A breakdown is shown in Table 4 below.

Table 4: TAS Estimate of NGT Operating Costs (2012 Prices)

Item	£m
Fuel†	0.38
Tyres	0.10
Maintenance	0.23
Infrastructure Maintenance	0.23
Insurance	0.16
Drivers	1.57
Conductors*	1.57
Administration staff and sundries	1.13
Staff training	0.26
Overheads	0.24
TOTAL	**5.86**

**- A mixed roster of driving and conducting duties is assumed, paid the same rates. It may be possible to recruit conductors at a lower cost, and further reduce manpower needs by not deploying them in the evenings and on Sundays.*

† Estimated at 14p per Kwh, 1.99 Kwh per kilometre. Further research may refine this estimate.

Corridor Market Profile 3

3.1 Introduction

3.1.1 In this section of the report, we consider the market profile of the corridor, looking at the population within 400 metres of the NGT alignment.

3.1.2 By examining the breakdown of the population by age and gender, it is possible to estimate the bus demand that should be generated by the corridor provided that the existing network is performing in line with its market potential. The estimation is based on trip rates for the different categories of the population derived from the Department for Transport's annual series of National Travel Surveys.

3.1.3 It will be appreciated that by no means all the demand would be within the radial corridor: some people in the suburbs will travel orbitally, and a wide range of routes exists to permit this. Near to the city centre, residents will have a wide range of destinations from which to choose.

3.1.4 Nevertheless, the overall total offers a very good 'sense check' as to the overall levels of likely public transport demand in the corridor, and a figure against which to check the current market performance of the operators.

3.1.5 The data is taken from the 2011 Census database and the area includes the areas in Belle Isle that would be served by the revised NGT route.

3.2 Demographic Analysis

3.2.1 A series of different demographic measures have been calculated for the Leeds City Council Wards through which the proposed NGT route passes.

3.2.2 The wards concerned are:

- Northern Corridor
  - Adel and Wharfedale
  - Headingley
  - Hyde Park and Woodhouse
  - Weetwood
- City and South
  - Burmantofts and Richmond Hill
  - City and Hunslet

- Middleton Park

3.2.3 The demographic profile of the corridor is shown in Table 5 below, and individual components of this are further analysed in the following two sections looking at the parts of individual wards that would be served by NGT.

3.2.4 It will be seen that the total resident population was 45,473, living in 17,247 households. Of the people 4,840 were under 16 (10.6%) and 4,517 were over 65 (9.9%). On this basis, we would expect the corridor to generate approximately 8.2m passenger journeys per annum.

Table 5: Corridor Demographic Profile

Item	Whole Corridor		Northern		City & South	
	Number	%	Number	%	Number	%
Total Population	45,473		33,074		12,398	
Under 16s	4,840	10.6%	3,165	9.6%	1,675	13.5%
Over 65s	4,517	9.9%	3,421	10.3%	1,096	8.8%
Total Households	17,247		11,667		5,580	
Households without a car	47.2%		42.1%		57.8%	
Estimated Bus Demand	8.18m		5.74m		2.44m	

3.2.5 A more detailed examination of the profile for the northern and southern elements is contained in the sections which follow.

3.3 Northern Route

3.3.1 The northern route serves a much higher population, and as might be expected the age profile of the inner wards (Hyde Park & Woodhouse and Headingley) differs sharply from that of the outer two (Adel & Wharfedale and Weetwood).

3.3.2 The total catchment of the northern route is 33,074 people, generating estimated public transport demand of 5.74 million trips. The age and gender profile of the population served by the NGT alignment in each of the wards is shown in Table 6 below.

3.3.3 The inner wards contain very small proportions of children under 16 and the over 60s, but very high proportions of people aged 16-20 and 21-29. This reflects the high numbers of students and young professionals in these wards. This is important, since the NTS data shows that people in these age bands have very high levels of trip making.

Table 6: Demographic Profile, Northern Wards

	Adel & Wharfedale		Headingley		Hyde Pk & Woodhouse		Weetwood	
Population served	588		10,816		11,008		10,663	
Children under 16	103	17.5%	392	3.6%	1,084	9.8%	1,587	14.9%
Over 60s	174	29.7%	609	5.6%	654	5.9%	1,983	18.6%
Households served	257		3,286		3,854		4,270	
% no car Households	15.1%		41.2%		61.8%		26.7%	

Table 7: Age and Gender Analysis, Northern Wards

Age Band	Adel & Wharfedale		Headingley		Hyde Park & Woodhouse		Weetwood	
	Male	Female	Male	Female	Male	Female	Male	Female
16-20	15	14	1,492	2,037	1,165	1,470	724	837
21-29	21	21	2,572	2,383	2,225	2,162	1,008	896
30-39	31	34	407	248	682	476	646	896
40-49	45	46	208	140	355	291	614	603
50-59	41	44	171	158	243	200	528	588
60-69	39	41	137	113	164	161	426	442
70 +	40	54	137	222	143	187	432	684
% under 29	6.1%	5.9%	37.6%	40.9%	30.8%	33.0%	16.3%	16.3%

3.4 Southern Route

3.4.1 The current population that would be served by the southern route is much lower, at 12,398. The majority of these are in the Hunslet and City ward, which has a relatively high proportion of younger people (24.6% male, 24.5% female) though it also contains more children than the northern inner wards. (22%). This suggests a large number of young families. In addition, the proportion of over 60s in the Hunslet area is well below average.

Table 8: Demographic Profile, Southern Wards

	Burmantofts and Richmond Hill		City and Hunslet		Middleton Park	
Population served	92		11,361		945	
Children under 16	20	22.0%	1,438	12.7%	217	23.0%
Over 60s	14	15.2%	915	8.1%	167	17.7%
Households served	43		5,126		411	
% no car households	59.2%		59.0%		43.1%	

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Table 9: Age and Gender Analysis, Southern Wards

Age Band	Burmantofts and Richmond Hill		City and Hunslet		Middleton Park	
	Male	Female	Male	Female	Male	Female
16-20	4	4	776	979	32	33
21-29	7	8	2,022	1,807	57	71
30-39	8	7	1,130	744	61	66
40-49	7	6	533	363	67	71
50-59	5	4	356	299	49	53
60-69	3	3	216	202	39	40
70 +	3	4	218	280	36	52
% under 29	11.5%	12.3%	24.6%	24.5%	9.4%	11.0%

3.5 Conclusions

3.5.1 Demographic analysis and trip rate modelling suggests that the NGT corridor has the market potential to generate some 8.2 million passenger journeys per annum by bus.

3.5.2 As will be seen from the following chapter, our estimate of FirstGroup patronage on the corridor in 2013 suggests that current demand is approximately five million – which means that the current network is performing below market potential, and has the potential to grow significantly.

3.5.3 At the same time, the demographic analysis also reinforces the doubts about the ability of NGT to achieve a switch from bus of over 8 million passenger journeys per annum – this would require the system to capture virtually all the trips from this corridor. In practice, this is most unlikely, since:

- As already noted, not all trips will be on these radial corridors. Some will be orbital trips to other suburbs
- At least a proportion of the trips may be expected to remain on the existing bus network which might, for a variety of reasons, be more convenient

4.1 Bus Patronage Analysis

4.1.1 TAS has undertaken an analysis of bus patronage data supplied by First West Yorkshire for two sample periods in June 2013 and August 2013. The outputs of FWY's electronic ticket machine have been analysed using QData Software.

4.1.2 The data analysed covered a twenty-five day period from 3 to 28 June 2013, and a second period during the University vacations, covering the twenty-one days from 5 to 25 August 2013.

4.1.3 The routes analysed are listed in Table 10 below, together with an estimate of the proportion of existing patronage where the journeys made would be served directly by NGT. Routes where more than 50% of journeys for which NGT would offer a direct alternative are highlighted in red.

Table 10: Routes and Patronage Analysed

Route and Terminals	% with NGT as direct alternative	
	Term	Vacation
Northern Corridor		
Service 1, Beeston - Holt Park	58%	54%
Service 6, Bus Station - Holt Park	72%	72%
Service 28, Clarence Dock – Adel	73%	74%
Service 97, Bus Station - Horsforth – Guiseley	40%	38%
Southern Corridor		
Service 12, Middleton – Roundhay	25%	25%
Service 13, Middleton – Brackenwood	30%	30%
Service 13A, Middleton – Oakwood	23%	26%
Service 48, Middleton - Wigton Moor	20%	24%
Service 74, Middleton - City - Hunslet - Middleton	15%	16%
Service 85, Bramley – Morley	10%	11%
Service 87, Chapeltown - Knoll Park	13%	12%
Overall	**43%**	**41%**

4.1.4 The daily flows where NGT would provide a direct alternative have been identified and are summarised in the two tables which follow, looking separately at the north and south corridors.

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Table 11: First West Yorkshire Daily Patronage, NGT Northern Corridor (2013)

Stage	Average Boardings per Day Monday to Friday	
	Term Time	Vacations
Clarence Dock	89	90
City Square, Rail or Bus Station	2,027	1,592
St John's Centre	3,279	2,777
University Steps	1,007	829
Hyde Park Corner	1,296	865
Richmond Avenue	379	253
Shaw Lane / Arndale Centre	2,117	1,947
Glen Road	505	424
Lawnswood School	555	329
Otley Old Road	218	192
Hospital Lane/Lawnswood Arms	379	346
Holt Park Shopping Centre	901	719
Total	**12,753**	**10,364**

Table 12: First West Yorkshire Daily Patronage, NGT Southern Corridor (2013)

Stage	Average Boardings per Day Monday to Friday	
	Term Time	Vacation
Belle Isle Circle	95	81
Moor Road or Leasowe Road	1,486	1,316
Hunslet Shopping Centre	870	780
Hunslet Road, South Accommodation Road	1,437	1,336
Great Wilson Street, Crown Point Road	239	232
Bus Station / Eastgate	482	508
Vicar Lane / Corn Exchange	205	207
Infirmary St	4	4
Total	**4,817**	**4,463**

4.1.5 In considering NGT's potential, allowance for patronage on other services needs to be made, for which we have no data. These are:

- the term-time routes to the Leeds Metropolitan University campus run by Arriva (93) and Geldards (93B)

- demand within Leeds on the Arriva inter-urban services on the A61 corridor to the south
- demand within the city centre currently carried on other FirstGroup services

4.1.6 Analysis of these figures, accompanied by figures for weekend flows, enables an estimate of the current annual patronage to be derived. The methodology for doing this is shown in Table 13 below. This assumes 363 day operation, with no service on Christmas Day or Boxing Day.

Table 13: Calculation of Annual Patronage Estimates (2013)

Time Period	Term Time	Vacation
Mon-Fri – working days	153	100
Saturday patronage proportion of Mon-Fri day	0.72	0.93
Occurrences in Year	31	21
Sunday patronage: proportion of Mon-Fri day	0.37	0.48
Occurrences in Year	31	21
Bank Holidays	2	4

4.1.7 These calculations mean that our estimate of total patronage on the routes directly affected by NGT is 12.4m, of which 5.1m would have the option of a direct switch, whilst 7.3m would have no alternative to the existing bus service and would therefore be 'at risk' of service reductions prompted by the introduction of NGT.

4.1.8 The promoters' business case assumes that in 2016, 8.4 million passengers per annum would switch from existing bus services to NGT. The analysis above suggests that the existing demand for bus services in the corridor is much lower than this figure, even before any debate about users' propensity to switch to the new mode.

4.2 Patronage Not Served by NGT

4.2.1 Our analysis of services on the northern corridor shows that in 2013 there were 2.6 million passenger journeys made on the bus services in the NGT corridor that would not be served by the new mode. The analysis by route is shown in Table 14 below.

4.2.2 The NGT promoters' assumptions are that two routes – services 1 and 6 - would be halved in frequency. By multiplying the figures for services 1 and 6 up to an annual estimate using the methodology outlined in Table 13 above, it is possible to estimate the number of passengers who would be directly inconvenienced by the NGT plans by the assumed reductions in frequency. The

total would be 683,000 – many of whom could very well have a car available for their trip. A switch of mode by such people would run the risk of increasing congestion on the corridor.

Table 14: Patronage at Risk of Service Cuts

Route	Average Boardings per Day Monday to Friday	
	Term	Vacation
Service 1 - North	509	474
Service 1 - South	3,912	3,414
Service 6	1,753	1,517
Service 28	454	395
Service 97	1,926	1,738
Total	**8,555**	**7,537**

4.3 The Competitive Position

4.3.1 It is inevitable that the reductions assumed in existing bus services would disadvantage existing bus passengers, who would suffer a reduction in the frequency of their local bus service without the consolation of being served by NGT. This would apply to areas of Cookridge, Tinshill and Holt Park.

4.3.2 Though the promoters assume that other areas, most notably Weetwood and Adel, would retain their service on route 28, it is more likely that this service would no longer be commercially viable and would be liable to complete withdrawal. We would expect that the current service level on route 97 would also be at risk.

4.3.3 Even with the service reductions assumed, the corridor would still see a service of 16-18 buses an hour, averaging one every three or four minutes, against an NGT vehicle every six minutes.

4.3.4 Despite a separation of stops, and even accepting *some* customer preference for the "enhanced quality" offered by a trolleybus, the fact remains that potential customers will see a bus in sight more times an hour than they will see a trolleybus – the clear risk from the promoters' point of view is that passengers will therefore head for the bus stop.

4.3.5 On the southern route, the largely segregated route means that NGT is unlikely to be subject to the same incidental "vehicle in sight" competition that it will face on the A660 corridor.

4.3.6 NGT's market position will therefore be about choice of stop – and there is a *prima facie* case for suggesting that the maintenance of the very high frequencies on the parallel bus corridors may encourage more users to stay

with their existing mode. In this case, the choice will be determined by other factors, including:

- the convenience of the city centre stops served by the respective services
- the walking distance to the nearest stop (particularly during the winter and in poor weather and for those with limited mobility)
- the availability of seating on the vehicles (particularly important for concessionary pass holders).

4.3.7 The availability of seating has been an issue elsewhere on light rail systems, with a lower rate of concessions in use on vehicles with lower seating capacity and higher ratios of standing passengers. As an example, a comparison between use of bus and light rail services by concessionary pass holders is contained in Table 15 below.

Table 15: Use of Concessionary Passes on Bus and Light Rail, 2012/13

Mode/Area	Total Journeys (Million)	Concession Journeys by Elderly/Disabled (Million)	% by concessions
Bus Services			
Shire Areas	1,282	429	33.5%
PTE Areas	1,002	280	27.9%
London	2,315	318	13.7%
Light Rail Services			
Croydon	30.1	5.3	17.6%
Manchester	25.0	6.5	26.0%
Nottingham	7.4	1.3	17.6%
Sheffield	14.4	5.0	34.7%
West Midlands	4.8	1.2	25.0%

Source: Department for Transport Bus and Light Rail statistics.

4.4 Conclusions

4.4.1 The analysis of current patronage on the NGT corridors suggests that the number of bus passengers carried by First West Yorkshire who would have a direct NGT alternative to their existing journey is 5.1 million. This has to be compared with the 8.4 million journeys expected to transfer from existing bus services to NGT in the promoters' forecast.

4.4.2 We believe therefore that the promoters' forecast of bus passengers switching to NGT is seriously over-stated. Even accepting that some NGT journeys would

switch from other operators' services, it is equally true that by no means all existing bus journeys on the corridor could be expected to switch to the trolleybus.

4.4.3 Our analysis also suggests that some 2.6 million existing bus journeys not served by NGT would be at risk of having a less frequent and slower journey as a consequence of the introduction of the new mode.

4.4.4 In the Cookridge, Tinshill and Holt Park areas, the assumptions that the promoters make about the future bus network would result in some 0.7m existing bus passengers losing half their existing frequency. It is also possible that passengers in the Weetwood and Adel areas would lose their service altogether.

The Patronage Forecast 5

5.1 Background

5.1.1 The patronage forecast has been prepared by Steer Davies Gleave and AECOM making use of the Leeds Transport Model ("**LTM**").

5.1.2 LTM is a Multi-Modal Transport Model developed through the Transport for Leeds project between 2008 and 2011, and co-funded by DfT, Metro, Leeds City Council and Yorkshire Forward. It covers the West Yorkshire region with a focus on Leeds metropolitan district, and was developed by AECOM in association with the Denvil Coombe Practice.

5.1.3 As is often the case with such models when used to forecast new modes of transport, they are highly sensitive to two areas in which assumptions have to be made:

- The use of boarding and stop penalties to simulate the difference in public responses between the new and existing modes of public transport
- The derivation and application of annualisation factors – the means by which single hour forecasts are factored up into an annual number.

5.1.4 Previous experience has also shown that promoters' forecasts – derived in order to justify public investment in a project – are different in character and approach from a commercial business case or a lenders' case.

5.1.5 From these differences have arisen previous variations between promoters' and bidders' cases over the last decade, not least for Leeds Supertram, the predecessor project to NGT.

5.2 NGT Forecast Overview

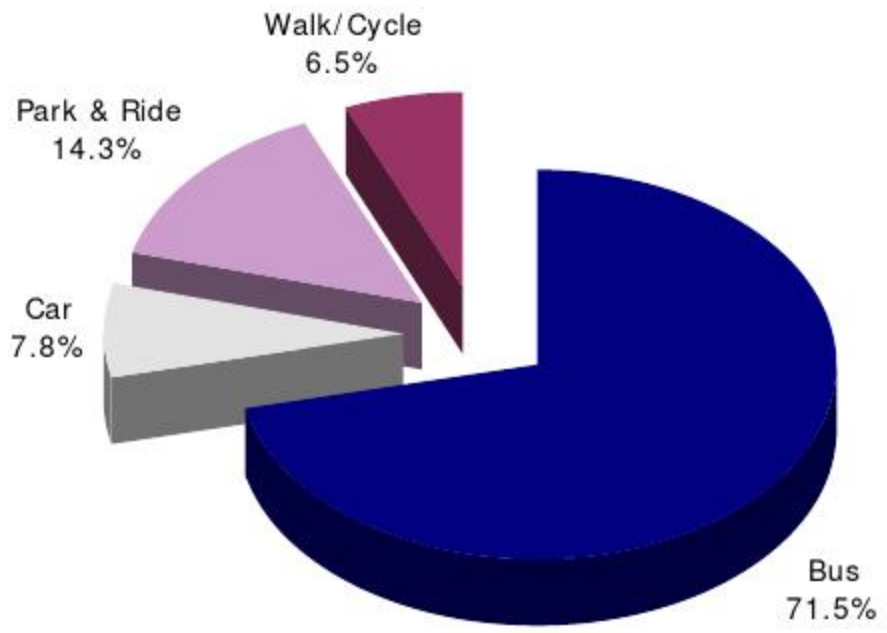
5.2.1 The business case assumes that the system would carry 11.8m passengers per annum in a notional 2016 year, rising to 14.9m in 2031 – an increment of 1.7% per annum, primarily driven by land use development and other market changes.

5.2.2 The model suggests four sources of demand:

- Transfer from Bus
- Transfer from Car direct
- Transfer from Car to P&R
- Transfer from 'Active Modes' (walking/cycling)

5.2.3 A breakdown of the forecast by these sources is shown in the chart at Figure B below. It will be seen that the lion's share of the forecast traffic is expected to come from existing bus services, with the two park and ride sites offering the next largest source.

Figure B: Breakdown of Forecast Patronage by Source



5.2.4 A more detailed examination of the methodology is provided in the sections which follow.

5.3 The Structure of the Forecast

5.3.1 The forecast is built from three individual modelled hours, representative respectively of the AM Peak, the InterPeak and PM Peak.

5.3.2 These are then combined into an annual forecast using a series of multipliers, known as 'annualisation factors', which are derived from an analysis of existing traffic and patronage flows.

5.3.3 The outputs provide for two modelled years – 2016 and 2031, with a series of assumptions on economic growth, land use development, population and employment applied to the overall demand for transport in the City.

5.3.4 The individual hour forecasts for each category and each forecast year are summarised in Table 16 below. It is noticeable that in both forecast years the AM peak and Inter-Peak hours are very similar in volume, with the Inter-Peak having the edge as a result of higher volumes of car and P&R transfers. The PM Peak is forecast to be the busiest period of the day – reflecting the fact that, in provincial cities, the evening peak still tends to be concentrated into two hours (1600-1800).

Table 16: Individual Single Hour NGT Forecasts

Demand Source	2016*			2031		
	AM Peak	Inter-Peak	PM Peak	AM Peak	Inter-Peak	PM Peak
Transfer from Bus	1,949	1,921	3,102	2,417	2,460	3,842
Transfer from Car	166	242	138	206	310	171
Park and Ride - Total	406	405	476	504	518	590
Walk/Cycle	146	219	92	181	281	114
Total	2,667	2,787	3,808	3,308	3,569	4,717

** - breakdown between sources for individual hours for 2016 not published by promoters for this iteration, though the totals are. Figures for each demand source are derived from applying the 2031 proportions to the overall 2016 forecast.*

5.4 Annualisation Factors

5.4.1 The annualisation factors applied to deliver an annual forecast are summarised in Table 17 below. We note that these factors are used for the entire model, and no differentiation is made for different local markets. The derivation of the factors used in LTM is explained in Appendix 12 to the submission to DfT, *Annualisation of Economic Benefits V4.*

Table 17: Annualisation Factors Used

Mode	AM Peak	Inter-Peak	PM Peak
Public Transport	772	2,782	514
Highways	727	3,024	476

5.4.2 Previous experience of the calculation of annualisation factors for other projects of this nature suggests that this approach is seriously flawed: in practice, the markets served by NGT will vary between the north and south portions of the route, and will be different from other sub-markets within the city. For example:

- The high proportion of students in the A660 corridor to the north of the city centre means that there will significant differences in passenger flows between term time and vacations.
- The southern section, which has a lower resident population and fewer trip attractors at present, could be expected to be more heavily reliant on commuter flows, with lower activity during the evenings and weekends – also lowering the annualisation factor.

5.4.3 Whilst highway annualisation factors represent current flows of private car traffic in the city, it is unwise to assume a uniform willingness to switch modes across the week. Trip origins and destinations vary much more widely in the evenings and weekends, and the cost and availability of parking is very

different. For this reason, we have previously recommended an assumption of much lower transfers from private car (and park and ride) at these times – typically reducing the propensity to switch by between 50% (weekend daytime) and 75% (early mornings and evenings).

5.4.4 These suggested adjustments would reduce the Highway Inter-Peak factor by around 17%. The resulting factors would be as shown in Table 18 below.

5.4.5 For public transport, analysis of electronic ticket machine data from First West Yorkshire suggests that public transport use on the Headingley corridor drops by 19% during vacations. There is also a difference on services to the south of the city, but less marked at only 7%.

5.4.6 However, analysis shows that the factors in the Leeds Transport Model for weekend use are understated for these corridors. Growth in public transport use during the evenings and at weekends has occurred in recent years, and therefore TAS would recommend increasing the factors.

Table 18: Recommended Changes to Annualisation Factors

Source	Mode	AM Peak	Inter-Peak	PM Peak
LTM	Public Transport	772	2,782	514
TAS	**Public Transport**	**722**	**3,004**	**479**
LTM	Highways	727	3,024	476
TAS	**Highways**	**727**	**2,519**	**476**

5.4.7 The changes to the annualisation factors would have the effect of reducing the patronage forecast by 5.1% in the AM peak and by 5.8% in the PM Peak. However, these reductions would be offset by an increase in off-peak traffic of 1.9%. The net result would be a reduction of 1% in overall NGT demand.

5.5 Modelling Approach

5.5.1 As noted above, over 70% of the traffic on NGT is assumed to switch from existing bus services.

5.5.2 The reasoning behind the projected switch is that NGT journey times would be faster, but also that other factors would make the public change the mode of travel.

5.5.3 The derivation of the factors is described in a report to the Promoters by Steer Davies Gleave entitled *New Generation Transport Quality Factors* and dated September 2011.

5.5.4 These are based on Stated Preference Surveys undertaken by SDG in 2008, calibrated after discussions with the Department for Transport to take account of the DfT's own research, commissioned from AECOM in 2008/09, *The Role of*

Soft Measures in Influencing Patronage Growth and Modal Split in the Bus Market in England.

5.5.5 The following table summarises the quality parameters recommended by SDG for use in LTM.

Table 19: SDG Recommended Modelling Parameters for NGT

Journey Purpose	Business	Commute	Other
Walk time relative to in-vehicle time	1.30	1.30	1.30
Wait time relative to in-vehicle time	1.67	3.30	2.26
'Standard bus' boarding penalty (minutes)	2.81	5.55	5.55
NGT boarding penalty (minutes)	0.00	0.00	0.00
All modes interchange penalty (minutes)	5.00	5.00	5.00
Stop Penalties Package Components			
Poor lighting	5.36	10.59	10.59
No shelter	7.07	13.98	13.98
Standard shelter (included in no shelter)	0.64	1.27	1.27
No real time information	5.15	10.18	10.18
No CCTV	5.78	11.42	11.42

In order to avoid over-calculation, the value of benefits is calculated on a sliding scale, so that the first 10 minute saving is fully valued, the second 10 minutes are counted at 50%, and the third at 25%

5.5.6 The net result of these calculations is that conventional bus services are given a boarding penalty of 5.55 minutes. Passengers choosing NGT over bus would also enjoy a reduction in their waiting time of 11.73 minutes.

5.5.7 We have some difficulty in accepting this methodology, and in previous projects where this has been put forward, have always recommended a more cautious approach, in line with the one adopted by MVA and ourselves in the successfully delivered projects in Croydon and Nottingham.

5.5.8 In essence, our objection to the methodology set out above is twofold:

- We have concerns that Stated Preference surveys may not adequately represent actual consumer preferences on the ground, being largely theoretical exercises in which potential customers are asked to express their preferences based on photographs and descriptions.
- We believe that the methodology of identifying actual minutes for each value and applying them to all journeys in the model regardless of distance travelled is flawed. We believe that the penalties should be applied as a proportion of the in-vehicle time for the journey being modelled, and not as an absolute value for all journeys.

5.5.9 In previous projects, this scepticism about the SDG approach has been met by requesting model runs from the promoter under different sensitivities, with the elimination or serious reduction in the use of such penalties in order to enable all concerned to understand the sensitivity of the model and the project to such assumptions.

5.5.10 The approach we recommend would have the effect of reducing the forecast transfers between bus and NGT, though it is difficult to quantify its effect without access to more detailed data. Depending on the assumptions chosen, this could reduce transfers from the existing bus network by up to 23%. This would reduce the overall patronage by around 22%.

5.6 Geographical Split of the Forecast

5.6.1 The PEBCS provides outputs from the model showing the forecast boardings and alightings for NGT (tables 8.5 and 8.6). Analysis of these figures gives an indication of the relative importance of each element of the proposed system, and is presented in Table 20 below. It will be seen that, despite serving Hunslet Centre and a large Park and Ride site, the southern branch of the system would carry a relatively small proportion of the overall traffic.

Table 20: NGT Boardings & Alightings (%) by Line Section, 2016

	Boarding	Alighting	Boarding	Alighting	Boarding	Alighting
	Northbound		Southbound		Both Directions	
AM Peak						
Northern	15.7%	63.3%	87.0%	33.1%	52.1%	47.9%
City Centre	37.1%	32.7%	10.8%	49.1%	23.8%	41.0%
Southern	47.0%	4.2%	2.0%	17.8%	24.1%	11.1%
Inter-Peak						
Northern	22.3%	68.3%	71.1%	25.3%	47.6%	46.0%
City Centre	44.1%	28.7%	26.0%	44.8%	34.8%	37.0%
Southern	33.6%	3.0%	2.8%	29.9%	17.7%	16.9%
PM Peak						
Northern	24.7%	86.8%	54.0%	15.6%	38.1%	54.2%
City Centre	55.3%	12.1%	41.2%	33.1%	48.8%	21.7%
Southern	20.0%	1.1%	4.8%	51.4%	13.1%	24.1%

5.7 Planned Service Capacity

5.7.1 Analysis of the model outputs on boardings and alightings enables an analysis of whether the planned service would be adequate to carry the forecast numbers. Table 21 below shows the Northbound loads, for the three single

hour forecasts, assuming that the loads are spread evenly through the hour. Table 22 shows the same analysis for the Southbound flows.

Table 21: Northbound Loads and Capacity (2016 Promoter Forecast)

	AM PEAK		INTER PEAK		PM PEAK	
	Load	Per Vehicle	Load	Per Vehicle	Load	Per Vehicle
Stourton P&R	250	25	117	12	62	6
Flax Mill Lane	384	38	262	26	123	12
Penny Hill Centre	437	44	298	30	178	18
Joseph St	455	46	324	32	197	20
Crown Point Rd	510	51	359	36	227	23
Brewery Wharf	564	56	415	42	396	40
Lwr Briggate	561	56	412	41	392	39
Trinity	542	54	470	47	554	55
City Square	620	62	555	56	1045	105
Cookridge Street	619	62	619	62	1283	128
Civic	538	54	590	59	1350	135
University	331	33	591	59	1599	160
Woodhouse	326	33	572	57	1559	156
Hyde Park Corner	325	33	534	53	1420	142
Headingley Hill	292	29	427	43	972	97
Headingley Centre	290	29	397	40	749	75
St Chads	289	29	365	37	712	71
Churchwood	254	25	336	34	653	65
West Park	145	15	265	27	615	62
Lawnswood	97	10	260	26	554	55
Bodington P&R	56	6	120	12	218	22
Holt Park_Int	42	8	39	8	84	17
Holt Park	0	-	1	0	0	-

Table 22: Southbound Loads and Capacity (2016 Promoter Forecast)

	AM PEAK		INTER PEAK		PM PEAK	
	Load	Per Vehicle	Load	Per Vehicle	Load	Per Vehicle
Holt Park	86	17	84	17	54	11
Holt Park_Int	216	43	160	32	139	28
Bodington P&R	496	50	319	32	234	23
Lawnswood	529	53	380	38	258	26
West Park	559	56	413	41	268	27
Churchwood	584	58	434	43	335	34
St Chads	636	64	495	50	379	38
Headingley Centre	815	82	551	55	461	46
Headingley Hill	935	94	647	65	531	53
Hyde Park Corner	1018	102	696	70	544	54
Woodhouse	1026	103	694	69	527	53
University	778	78	643	64	625	63
Civic stop	732	73	661	66	669	67
Cookridge Street	621	62	638	64	730	73
City Square	302	30	458	46	847	85
Trinity	213	21	391	39	809	81
Lwr Briggate	206	21	381	38	786	79
Brewery Wharf	122	12	322	32	735	74
Crown Point Rd	104	10	283	28	635	64
Joseph St	102	10	273	27	581	58
Penny Hill Centre	70	7	223	22	490	49
Flax Mill Lane	27	3	116	12	283	28
Stourton P&R	0	-	0	-	-2	- 0

5.7.2 The above analysis suggests that, assuming a single-articulated vehicle with a total capacity of 150 (56 seated, 94 standing, based on the capacity of the articulated buses used in London between 2002 and 2011), the service would have insufficient capacity northbound during the evening peak. This would mean that passengers boarding at University and Woodhouse stops would be unable to board the first vehicle that came along.

5.7.3 Given the tendency for there to be 'super peak' periods, this problem might be expected to be rather more serious than this analysis suggests. Were this to happen, it would leave no capacity for growth in future years, cause some reputational damage and result in people switching back to conventional bus services.

5.8 Transfers from Bus: A660 Corridor

5.8.1 The importance of the transfers from existing bus services to NGT, coupled with the preponderance of traffic from the northern end of the planned route means that assumptions concerning the bus network on the A660 corridor are fundamental to the scheme.

5.8.2 We have already discussed in Section 5.5.6 our concerns about the modelling approach to this subject, and this must also be considered in the context of the current service pattern and any expected changes to it.

5.8.3 The current pattern of services is shown in Table 23 below. This is illustrated graphically in Figure C overleaf. The three columns illustrate respectively:

a) the situation used in the model (which operated until December 2012)

b) the revised pattern introduced in January 2013

c) the network assumed by the promoters to operate once NGT opened.

Table 23: Bus Services on the A660 Corridor

Service No	Operator	(a) Currently Modelled	(b) Jan-13	(c) Assumed Post NGT
1	First Leeds	6	8†	3
6	First Leeds	6	6	3
28	First Leeds	3	3	3
93	Centrebus*	2	2	2
93B	Geldards	3	3	3
95	First Leeds*	3	0	0
97	First Leeds	3	3	3
X84	First Leeds‡	3	3	3
	NGT	0	0	10
	Term time total	29	28	28
	Vacation total	21	21	23

** - term time only †- reduces to 6 in vacations ‡- limited stop service, not carrying local passengers*

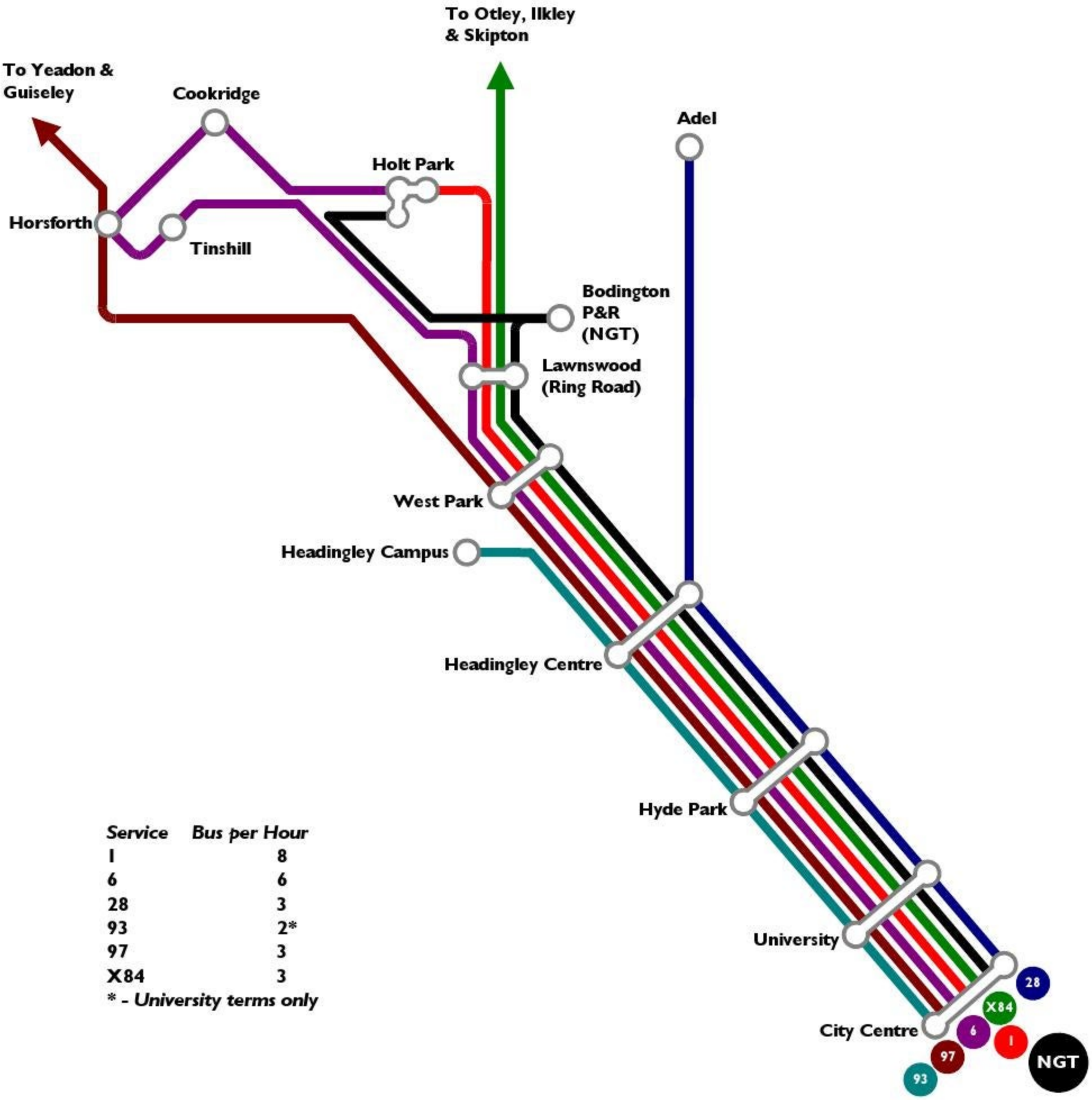
5.8.4 It will be seen that since January 2013, a combined frequency of 28 buses per hour between Headingley and the city centre has operated, reducing to 21 during vacations.

5.8.5 The business case assumes a response from the bus operators in which Service 95, which previously ran between Bodington Hall and Leeds station, would be withdrawn completely. The other assumption was that services 1 and 6 would be reduced in frequency by 50% from six buses per hour to three.

5.8.6 However, the withdrawal of the 95 has happened anyway following the closure of Leeds University's halls of residence at Bodington in January 2013, to be replaced by an increase in term-time frequency on service 1 from six to eight buses an hour.

5.8.7 Overall, therefore, the business case assumes that the arrival of NGT would result in a net increase of two vehicles per hour in the frequency of services along the corridor from the situation prevailing at the time of the work.

Figure C: A660 Corridor - Buses and NGT



Service	*Bus per Hour*
1	8
6	6
28	3
93	2*
97	3
X84	3

** - University terms only*

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5.8.8 Even with the service reductions assumed, the corridor would still see a service of 16-18 buses an hour, averaging one every three or four minutes, against an NGT vehicle every six minutes.

5.8.9 Despite a separation of stops, and even accepting *some* customer preference for the "enhanced quality" offered by a trolleybus, potential customers will see a bus in sight more times an hour than they will see a trolleybus – and therefore head for the bus stop. There is a real risk that the stop separation between the two modes will cause discontent and resentment amongst passengers, but that the 'vehicle in sight' behaviour will favour the bus over the trolleybus – especially given equivalent fares and inter-available tickets.

5.9 Transfers from Bus: Southern Route

5.9.1 The more off-road nature of the southern end of the NGT route means that there are no directly comparable bus services. However FirstGroup's services numbered 12, 13, 13A, 48, 74, 85 and 87 provide seventeen vehicles an hour along the corridor between Leeds city centre and Balm Road in Hunslet.

5.9.2 Meanwhile, ten buses an hour pass the proposed Stourton Park and Ride site, in the form of Arriva Yorkshire's 110, 444 & 446. The A61 corridor between Thwaite Gate and the city centre is also served by six buses an hour on four other Arriva routes, the 167/8, 189 and 410. All these are inter-urban routes coming into the city from Wakefield, Outwood, Rothwell and Castleford.

5.9.3 It is inevitable that the opening of NGT would result in some abstraction from these services, though it is difficult at this stage to quantify the likely loss. A key risk to the reliability of both NGT and existing bus services may well be congestion caused in Church Street, Hunslet by the addition of ten NGT vehicles an hour in each direction to the 17 already running.

5.9.4 The pattern of existing bus services and NGT is illustrated in the diagram at Figure D overleaf. The promoters' business case assumes no reduction in service levels.

5.10 City Centre Routing

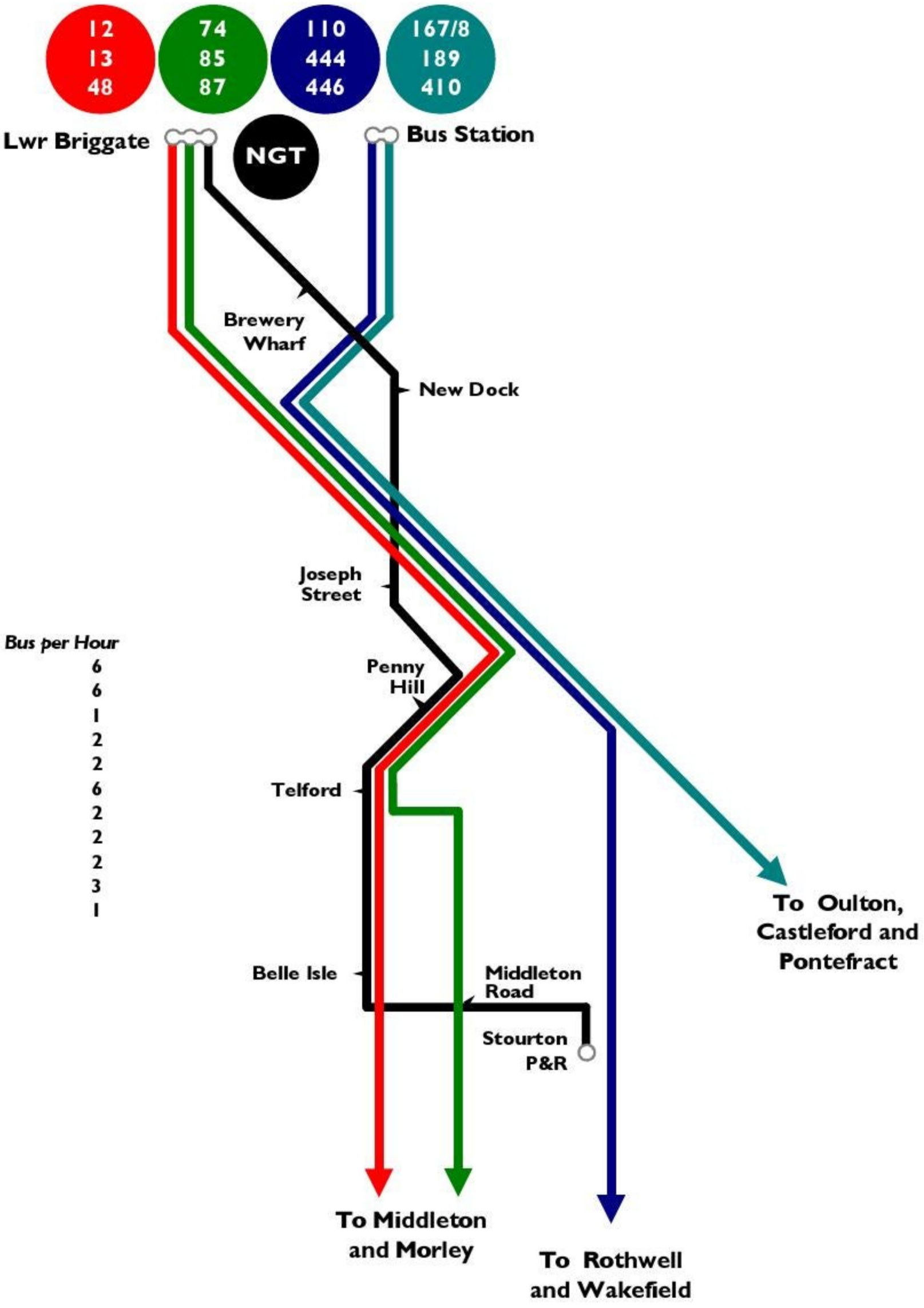
5.10.1 Figure E shows the frequency and distribution of existing services around Leeds city centre. Services from the North follow two main routes around the centre, service 1 follows the NGT route along Park Row serving the west side of the centre and the Railway Station. The vast majority of other services from the north head along The Headrow, serving the east end of the centre. Service 6 starts from and terminates at the Bus Station which offers the ability to interchange with other services, particularly interurban ones; this end of the city is completely omitted by the proposed NGT route. The Metropolitan

University service (93) and the Adel service (28) continue across the city centre to Clarence Dock.

5.10.2 Services from the south have three main routes in the city centre. The high frequency cross city services 12/13/13A enter via Leeds Bridge before serving Vicar Lane, which, it could be argued, is the closest to the centre any bus following a north–south route gets. Other services skirt the side of Clarence Dock before entering the centre via Crown Point Road and Duke Street. Services heading directly for the Station and City Square travel via Neville Street.

5.10.3 The bulk of Arriva's key interurban services terminate at the Bus Station, including the 110, 189 and 410 – effectively not penetrating the city centre at all. However services 167/168 and 444/446 continue beyond the bus station, to terminate at the west end of the city centre, having travelled along Boar Lane. This route is also followed by FWY cross city services 74/85/87 which continue across the city centre to destinations to the west.

Figure D: Southerrn Route - Buses and NGT



Service	*Bus per Hour*
12	6
13/13A	6
48	1
74	2
85/87	2
110	6
167/8	2
189	2
410	2
444	3
446	1

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Figure E: City Centre Bus Frequencies and Routing North

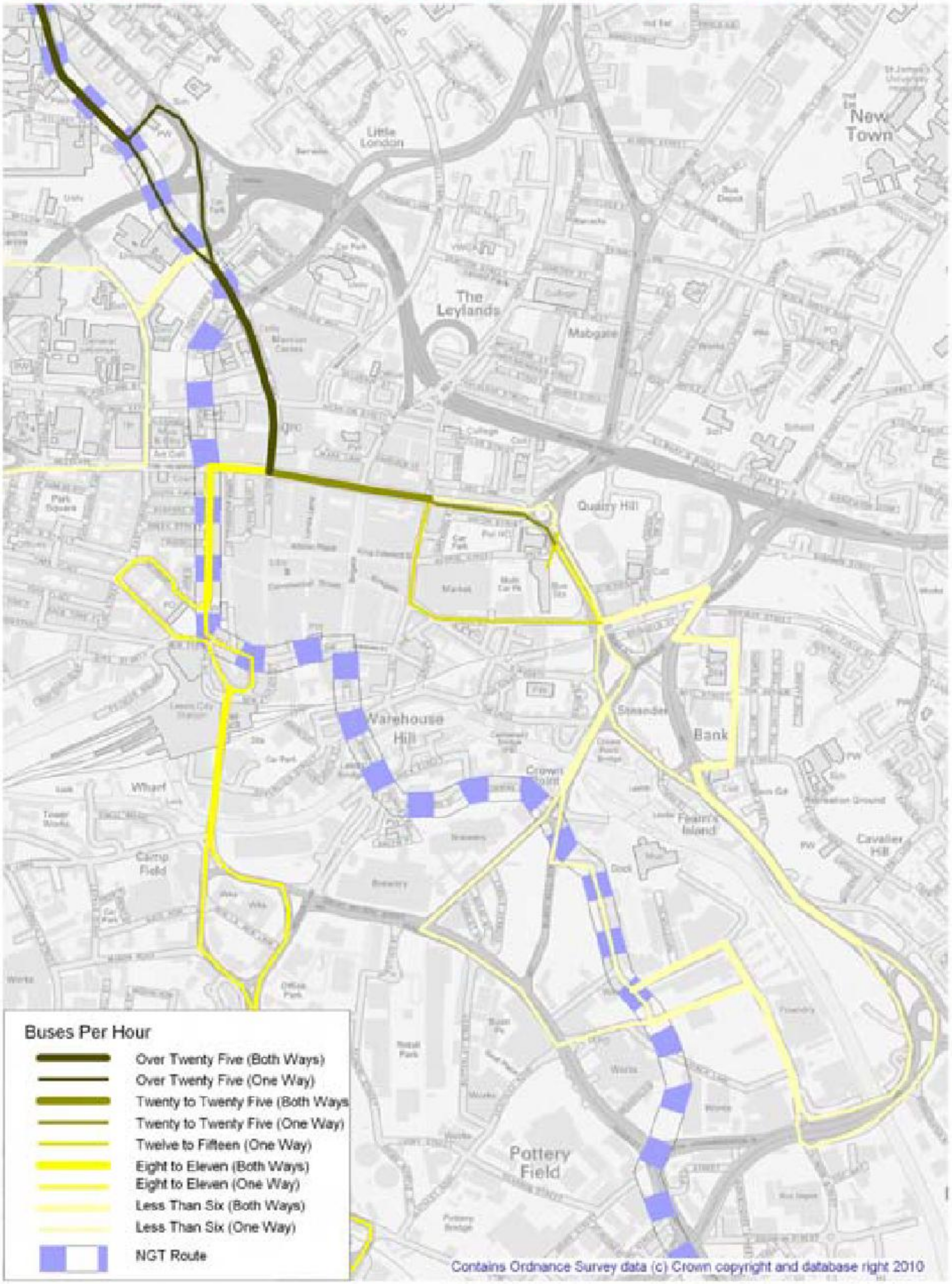

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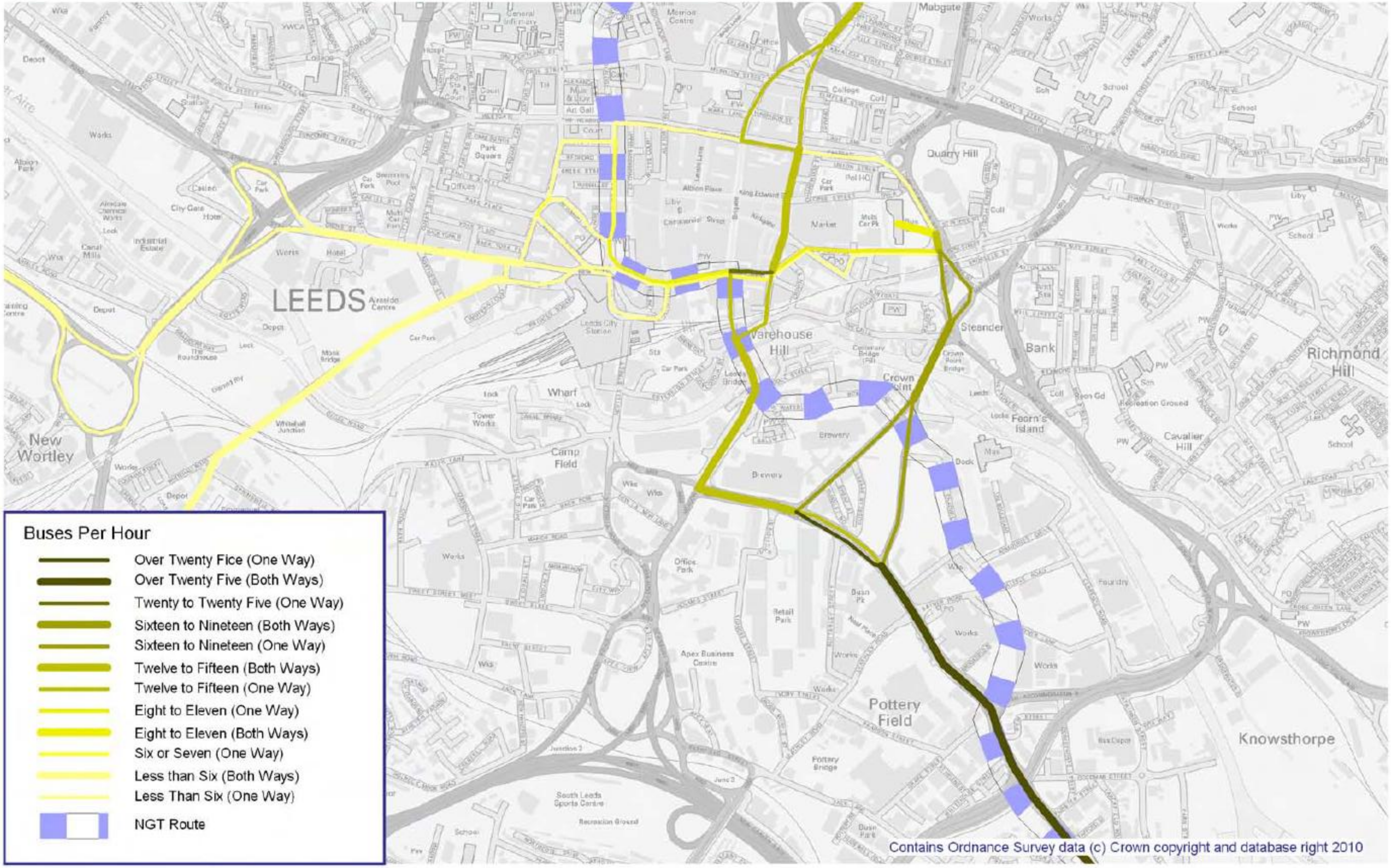
Figure F: City Centre Bus Frequencies and Routings South



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5.11 Direct Car Transfers: Highway Counts

5.11.1 The transport strategy section of the PEBCS notes that 60% of commuting trips into Leeds City Centre originate from outside the Outer Ring Road, and that 50% of these trips are made by car. As such, they are held to make a significant contribution to congestion levels.

5.11.2 The highway modelling work (figures taken from AECOM's document *New Generation Transport: Model Validation Report)* suggests that the observed vehicle flows during the AM peak period in 2007/08 when the counts were carried out were as shown in Table 24 below.

Table 24: LTM Traffic Counts, NGT Network (North Side)

North Side	Outer Ring Road A660		Hyde Park Corner A660	
	Outbound	Inbound	Outbound	Inbound
AM Peak (0700-1000)	1,316	2,565	1,377	2,537
Inter-Peak (1000-1600)	2,994	3,018	3,186	3,336
PM Peak (1600-1900)	2,283	1,771	2,443	1,695
Total for the day	6,593	7,354	7,006	7,568
Total both directions		**13,947**		**14,574**

5.11.3 On the south side of the city, the traffic count figures used in LTM are at the junction of the M621 with Pontefract Road, and on the A61 approaching the junction with South Accommodation Road. The figures collected in 2007/08 are shown in Table 25 below.

Table 25: Traffic Counts, NGT Network (South Side)

	M621/Pontefract Road		South Accommodation Road A61	
	Outbound	Inbound	Outbound	Inbound
AM Peak (0700-1000)	2,305	742	3,389	1,714
Inter-Peak (1000-1600)	1,800	2,094	4,506	3,936
PM Peak (1600-1900)	824	2,204	2,499	2,516
Total for the day	4,929	5,040	10,394	8,166

5.11.4 One means of checking what has happened to these figures since 2007/08 is to examine the figures produced by the Department for Transport, the count point data. These data provide information on average daily flows for each year on a series on links along each road. There are four links on the A660 which are of interest:

- On the approaches to Holt Park/Adel (the junction with Kingsley Drive), point 77666
- Between Holt Park and the A6120 roundabout, point 57490
- Between the A6120 roundabout and the University, point 17374
- Between the University and the City Centre slightly nearer to the city centre than Hyde Park Corner (point 8540)

5.11.5 The results from the counts are shown in Table 26 below. It will be seen that generally speaking the volume of cars and taxis using the A660 has fallen since the modelling work was done, with the exception of the stretch through Headingley and Hyde Park, where the volume is up slightly. This suggests though that this is the result of traffic using the A660 for short distances rather than for trips which would be capable of capture by park and ride or public transport.

Table 26: Department for Transport Traffic Counts: Average Annual Daily Flow, A660 Corridor, 2007 and 2012

Count Points	Cars & Taxis			All Traffic		
	2007	2012	% change	2007	2012	% change
Approaching Holt Park	12,862	12,296	-4.4%	15,169	14,330	-5.5%
Holt Park - Ring Road	14,655	14,291	-2.5%	16,997	17,000	0.0%
Hyde Park/Headingley	15,472	15,837	2.4%	18,281	18,810	2.9%
University/City Centre	15,622	15,234	-2.5%	18,038	17,969	-0.4%

5.11.6 To the south, the equivalent DfT traffic count point is the junction of the A61, A639 and M1, which shows a total count of 20,873 (of which 16,102 were cars and taxis). This is rather higher than the figure in LTM, but the latter focused solely on the M621, so excluding Pontefract Road figures.

5.11.7 The important thing, however, is that there has been a sharp fall in flows, reducing by around 16% to 17,500. Car traffic is down by 15.9%. The details for this point (ref 99528) are shown in Table 27 below.

Table 27: Department for Transport Traffic Counts: Average Annual Daily Flow, A639

Count Point	Cars & Taxis			All Traffic		
	2007	2012	% change	2007	2012	% change
A639, A61 to M1	16,102	13,540	-15.9%	20,873	17,500	-16.2%

5.11.8 Other count points in the area were only introduced in 2011, so there is no data available to compare with the LTM figures. Even so, the figures for the

two most recent years are shown for information in the table below. In addition to ref 99528, the points are:

- On the A61 in Hunslet, looking at flows between M621 Junction 4 and the A639 (ref 81400).
- On the A61 in Hunslet looking at flows between the A639 and Black Bull Street (ref 81385).

Table 28: Department for Transport Traffic Counts: Average Annual Daily Flow, A61

Count Point	Cars & Taxis			All Traffic		
	2011	2012	% change	2011	2012	% change
M621 Jn 4-A639	30,180	30,129	-0.2%	38,706	38,005	-1.8%
A639 - Black Bull St	17,980	17,904	-0.4%	22,445	22,257	-0.8%
A639, A61 to M1	13,755	13,540	-1.6%	17,721	17,500	-1.2%

5.11.9 This analysis would suggest that the model is currently overstating the potential flows from which NGT could gain its car transfers, and also may be overstating the levels of congestion currently being experienced – so reducing the generalised cost of car travel and thus the propensity to transfer to public transport directly or to park & ride.

5.12 Park and Ride Space Utilisation

5.12.1 We have validated the forecast traffic derived from P&R transfers against the spaces provided, and the number would appear to be adequate. Indeed, forecast occupancy levels would seem to be quite low at around 50% and would only rise to 62.4% by 2031. The information is summarised in Table 29 below.

Table 29: Park and Ride Space Occupancy (2016)

	Peak	Off Peak	Total
Forecast Patronage per annum (000s)	522	1,223	1,745
Divide by 2 for return journeys	261	612	873
Assumed vehicle occupancy	1.10	1.50	
Cars using spaces per year (000s)	237	408	645
Ratio of spaces used to pass. journeys	0.45	0.33	0.37
Annualisation factor	253	1,916	
Spaces used per day	938	213	1,151
Spaces provided			2,300
% occupied			50.0%

5.12.2 This may seem surprising: however, unlike most successful bus-based park and ride sites, these will not be offering a bespoke, dedicated express bus service (akin to the site at King Lane on the Scott Hall Road corridor) and this can be expected to reduce the success of the sites.

5.12.3 An alternative approach, particularly at Stourton, involving a direct non-stop journey to the city centre would probably offer the prospect of higher levels of patronage and a higher rate of intervention. However, it seems unlikely that such an approach at Bodington would be viable, though there may be a solution using vehicles from FWY's X84 Limited Stop service.

5.13 Forecast Summary

5.13.1 In summary, then, we believe that the current forecast may be significantly overstated, and in a bid situation would recommend a significant reduction in patronage.

5.13.2 The reasons are:

- Falls in car traffic on the two corridors by up to 16% since the onset of the recession, affecting both direct transfers from car to NGT, and park & ride to NGT
- An overstatement of existing bus demand in the corridor
- A failure of the annualisation factor calculations to take into account the effect of University vacations on existing and future patronage
- A reduction in car and P&R transfer annualisation factors to reflect lower propensities to transfer to public transport during the evenings and on Sundays
- An overstatement of the likely switch from existing bus to NGT because of the application of exaggerated mode penalties in the modelling.

5.13.3 Clearly, it is difficult to quantify the effects precisely without access to the LTM and the detailed parameters which underlie the forecasts. However, some estimation of the figures can be attempted. In order to estimate the switch from existing bus services, we have assumed that 60% of the in scope trips identified in Chapter 6 above would transfer to NGT.

5.13.4 The changes to the single hour estimates are shown in Table 30 below. It will be seen that the net effect would be to reduce the AM peak forecast by 55%, the single off peak hour by 46% and the PM peak hour by 61%.

Table 30: Estimate of Revised NGT 2016 Single Hour Patronage

Demand Source & Time Period	Promoters' Forecast	TAS Estimates	% Change
AM Peak			
Transfer from Bus	1,949	562	-71.1%
Transfer from Car	166	143	-14.0%
Park and Ride - Total	406	349	-14.0%
Walk/Cycle	146	146	0.0%
Total	**2,667**	**1,200**	**-55.0%**
Inter-Peak			
Transfer from Bus	1,921	722	-62.4%
Transfer from Car	242	208	-14.0%
Park and Ride - Total	405	348	-14.0%
Walk/Cycle	219	219	0.0%
Total	**2,787**	**1,498**	**-46.3%**
PM Peak			
Transfer from Bus	3,102	856	-72.4%
Transfer from Car	138	119	-14.0%
Park and Ride - Total	476	410	-14.0%
Walk/Cycle	92	92	0.0%
Total	**3,808**	**1,477**	**-61.2%**

5.13.5 Taking into account the differential effect of these changes, and the recommended changes to annualisation factors, the same comparison for the annual estimate is shown in Table 31 below. It will be seen that we believe that demand for NGT is therefore overstated by around 51%.

Table 31: Estimate of Revised NGT 2016 Annual Patronage

Demand Source & Time Period	Promoters' Forecast	TAS Estimates	% Change
AM Peak			
Transfer from Bus	1,504	406	-73.0%
Transfer from Car	121	104	-14.0%
Park and Ride - Total	295	254	-14.0%
Walk/Cycle	113	105	-6.4%
Total	2,033	870	-57.2%
Inter- Peak			
Transfer from Bus	5,344	2,170	-59.4%
Transfer from Car	732	524	-28.4%
Park and Ride - Total	1,223	876	-28.4%
Walk/Cycle	610	659	8.0%
Total	7,910	4,230	-46.5%
PM Peak			
Transfer from Bus	1,594	410	-74.3%
Transfer from Car	66	57	-13.9%
Park and Ride - Total	227	195	-13.9%
Walk/Cycle	47	44	-6.8%
Total	1,934	706	-63.5%
Grand Total for the Year	**11,877**	**5,805**	**-51.1%**

5.13.6 Finally, Table 32 below summarises the two views by source of demand.

Table 32: Summary of 2016 NGT Annual Forecasts

Demand Source	Promoters' Forecast	TAS Estimates	% Change
Transfer from Bus	8,443	2,986	-64.6%
Transfer from Car	919	685	-25.4%
Park and Ride - Total	1,745	1,325	-24.1%
Walk/Cycle	770	809	5.0%
Total	**11,877**	**5,805**	**-51.1%**

Revenue Calculation 6

6.1 Methodology

6.1.1 In order to estimate the revenue that would accrue to the NGT system, we have adopted the following methodology:

- From the tables of boardings and alightings in the PEBCS, estimated trip matrices have been prepared.
- Using existing FWY charges, an NGT fare table has been prepared.
- Multiplying the trip matrix by the fare table provides an estimate of the cash yield for adult single fares
- Discounts can then be calculated for different categories of passenger, including children, concessionary pass holders and prepaid ticket holders.
- The proportion of passengers using these tickets is then estimated by reference to analysis of existing ticket types used.

6.2 Results

6.2.1 The estimated cash yield per adult single fare payer at 2014 fares would be £2.1451 per peak journey and £2.1721 in the off peak.

6.2.2 Table 33 below shows the assumed pattern of ticket use, based on the analysis of existing ticket sales.

Table 33: Assumed Ticket Type Usage

Ticket Type	Peak Fares	Off Peak Fares
Adult Single	3.4%	11.4%
Child/Scholar Single	2.0%	5.3%
Adult Day Tickets	2.9%	12.9%
First Adult Prepaid	4.7%	12.3%
WYPTE Prepaid	1.9%	4.5%
Concessions	2.5%	20.3%
Park and Ride	3.0%	0.6%
Miscellaneous	0.1%	12.3%
Sub-Total	**20.4%**	**79.6%**

6.2.3 On the basis of these assumptions, we estimate that the average revenue per passenger for the system as a whole would be £1.5005. Consequently, were the system to carry the number of passengers forecast by the promoters, the

revenue in 2016 would be £14.7m. If the patronage was more akin to the TAS estimates discussed in section 5.13 above, the annual revenue in 2016 would be £8.8m. This compares with the £11m forecast for 2016 in the PEBCS submission (at 2002 prices), as shown in Table 8.2 of that document.

7.1 Background

7.1.1 The origins of the NGT scheme lie in the failure of the Leeds Supertram scheme, for which funding was withdrawn by the Government in 2005 following the completion of a bidding process in 2002 and 2003.

7.1.2 The private sector oversight of the scheme had shown that the project had a number of key weaknesses, and in particular that the patronage forecast had been significantly overstated.

7.1.3 TAS, alongside Halcrow, advised the Momentis consortium for the bid – which included FirstGroup, with Jarvis and Bombardier. Looking back, the Halcrow/TAS advice was that the 21.6m annual patronage forecast by the promoters was overstated by almost 40% and was more likely to be in the region of 13.6m a year. At the same time, the advisers felt that the estimates for the annual running costs had been understated, and the assumed running times would be difficult to achieve.

7.1.4 These views, which we understand were broadly supported by the only other bidder that remained in the competition (a consortium of Arriva and Siemens and AMEC), rendered the scheme unaffordable.

7.1.5 In announcing the Government's verdict, the then Transport Secretary Alastair Darling invited the Supertram promoters to devise an alternative, bus-based scheme which would deliver the bulk of the benefits at an affordable price. He promised that the DfT would assist with the development of such a project – and so the New Generation Transport project was born.

7.2 The Strategy

7.2.1 The strategic approach is derived from work done on the Leeds Transport Strategy – originally in the early 1990s - and subsequently updated between 2007 and 2010.

7.2.2 Having identified the prospects for continued population and employment growth driving continued strong economic growth, the strategy identified a number of problems and opportunities for the city's transport network. These are included as Table 2.1 in the NGT Programme Entry Business Case submission, and are reproduced here for ease of reference in Table 34 below.

7.3 Local Transport Plan Objectives

7.3.1 The LTP objectives which NGT is designed to fit are summarised below (para 2.16):

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- Economy. To improve connectivity to support economic activity and growth in West Yorkshire and the Leeds City Region.
- Low Carbon. To make substantial progress towards a low carbon, sustainable transport system for West Yorkshire, while recognising transport's contribution to national carbon reduction plans.
- Quality of Life. To enhance the quality of life of people living in, working in and visiting West Yorkshire

7.3.2 As discussed already, the NGT system would be imposed on top of an existing network of very frequent services, and as such is unlikely to make a significant improvement to connectivity. Indeed, by obliging operators of commercial services to reduce frequencies on routes to areas not served by NGT, it could be argued that connectivity would be reduced rather than enhanced.

7.3.3 Whilst the operation of trolleybuses would mitigate the environmental impact of the additional services provided by NGT, it would have minimal impact on the emissions and fuel consumption of existing bus services and therefore make no significant progress towards a low carbon transport system.

7.3.4 The quality of life issue is a difficult one to quantify, because the assessment is in many ways a subjective one. However, we find it difficult to identify any areas where NGT would make a significant difference to the quality of life of residents, employees or visitors. At the same time, the visual impact of the trolleybus overhead would undoubtedly reduce the quality of life in the city centre and the leafier suburbs it would penetrate.

7.3.5 Meanwhile, progress towards electrically powered buses without the need for wires is already well-advanced and could be given powerful assistance by support for a pilot project in West Yorkshire. This would greatly speed up the ability of bus operators to provide a low carbon system to a much wider area of West Yorkshire more quickly and without the need for huge investment in electrification infrastructure. The quality of service sought by the promoters could also be delivered more quickly to a wider section of the population of West Yorkshire by the negotiation of a quality partnership.

7.3.6 Thus, we do not believe that NGT would make a significant contribution to any of the LTP objectives, and that expenditure of similar sums in other ways would enable the promoters to move more quickly to deliver these objectives across a wider area of West Yorkshire.

Table 34: Leeds Transport Problems and Opportunities (Promoters' View)

Item	Problems	Opportunities	TAS Comments
Public Transport Network	■ Bus "bunching" caused by traffic congestion ■ Unreliable bus journey times caused by congestion ■ Poor quality public transport vehicles, with relatively poor environmental performance ■ Increasing public transport demand from numerous land use developments, but limited PT capacity	■ Provision of greater segregation for public transport and traffic management/UTMC measures to provide more reliable and punctual journeys ■ Provision of high quality vehicles with lowest emissions ■ Provision of additional public transport services and capacity to areas which generate the highest demand	■ Agreed. But introducing NGT on top of existing bus network and not improving bus infrastructure is not the most effective way to improve existing PT services ■ Do not accept the description of current PT vehicles as "poor quality" ■ Emissions can be reduced without the need for expensive and unsightly electrification infrastructure ■ The NGT scheme as proposed does not offer significant increases in PT capacity. NGT's relative inflexibility and high capital costs militates against a swift response to market changes
Highway Network	■ Increasing highway demand creates congestion and contributes to environmental impacts ■ Increased peak spreading due to a lack of highway capacity at peak times ■ 60% of commuting trips into Leeds City Centre originate from outside of the Outer Ring Road, 50% of these trips are made by car and make a significant contribution to congestion levels	■ Improved public transport to reduce car use and result in lower congestion and greenhouse gas emissions ■ High quality public transport with Park & Ride will provide an attractive alternative to the car	■ The forecast switch to NGT does not represent a significant reduction in car use ■ Agreed, but improved longer distance services from outer areas offering through journey opportunities would also be effective (arguably more so) ■ NGT as proposed does not offer significant improvements to services outside the ring road

Item	Problems	Opportunities	TAS Comments
Social Equity	■ Need for regeneration in south and east Leeds ■ High levels of households without a car or van in central, south and east wards Costs of bus travel rising substantially more than car travel	■ Provide public transport services to assist in the regeneration of pockets of deprivation ■ Provision of improved public transport services to link people to employment opportunities ■ Introduce a public transport system, where the Promoters can influence fare levels while securing financial sustainability	■ NGT does not address the issue of access for deprived areas adequately or as well as other solutions could ■ By focusing on only one corridor already well-served and extracting the vast majority of traffic from existing bus services, it is difficult to see how NGT assists with access to employment ■ Current NGT business case continues to increase fares above RPI. This could be achieved by a QP.
Economy	■ Limited opportunity to increase capacity for road-based commuting into Leeds to support economic and employment growth ■ High levels of unemployment in central, south and east wards	■ A new, high quality bus-based system with Park & Ride will offer an attractive alternative ■ Provision of improved public transport services to link people to employment opportunities	■ The capacity increase offered by NGT, particularly to the north of the city, is hardly significant and would not help deliver these objectives. ■ It is difficult to see how NGT effects any significant improvement to employment access

7.4 The Choice of Mode

7.4.1 We have reviewed the explanation of the choice of trolleybus over other alternatives contained in the PEBCS, and find it unconvincing. Some of the analysis is based on assertions for which no evidence is produced.

7.4.2 The environmental assessment of the project ignores the visual intrusion of overhead wiring – which is a particular issue at junctions or turning circles. As already noted, this would have an adverse impact on quality of life on the corridor served.

7.4.3 The assessment acknowledges that a small fleet with a unique layout would have capital cost implications, but makes no attempt to quantify this, or indeed the other implications for the project, including:

- An ageing fleet
- Route and timetable inflexibility
- Under-utilisation of expensive infrastructure

7.4.4 An Ageing Fleet

Once purchased, the fleet would be line-specific and would have to spend its entire 15-20 year life on the route, becoming progressively less modern and reducing the perceptions of quality associated with the NGT services. A more conventional fleet would be capable of cascade to less important services in favour of up to date modern vehicles, as happens with existing bus services

7.4.5 Inflexibility

The system would be inflexible, and incapable of incremental expansion to meet increases in demand or changes in route to serve new developments or changing patterns of demand. The provision of very small numbers of additional vehicles and/or additional infrastructure would be prohibitively expensive, and the approvals process time consuming and complex.

7.4.6 Infrastructure Utilisation

The infrastructure provided for NGT would be seriously under-utilised, thus preventing the maximisation of benefits to the community. Segregated alignment should be capable of accommodating many more than 10 vehicles per hour without causing undue delay, whilst as already noted the provision of separate stops throughout may be expected to cause public confusion and resentment – and act against the market success of the system.

7.4.7 The planned widening out of the alignment of stops to permit overtaking would reduce one capacity constraint. At signal controlled junctions, experience

elsewhere (notably Croydon) suggests that total priority for PT vehicles can be achieved for up to 24 vehicles per hour in each direction – more than twice the hourly flow of vehicles than is proposed for NGT. It is likely therefore that capacity would exist to permit additional vehicles to use the segregated sections of alignment proposed for NGT.

7.5 Evaluation of Alternatives

7.5.1 The scoping of the Next Best Alternative and the Low Cost Alterative (paras 3.8 to 3.15 of the PEBCS) as required by the DfT is in our view seriously flawed and designed to flatter the promoters' preferred scheme.

7.5.2 In particular, there seems little justification in removing the sections of off-highway busway from the Next Best Alternative. Provided guided technology was used, there would be no difficulty in obtaining the required powers under the Transport & Works Act for the off-highway sections, and the relevant services could be secured using a Statutory Quality Partnership (SQP) scheme and an access agreement as is the case in Cambridge. The additional powers granted under the Local Transport Act 2008 would be sufficient, in our view, to provide the necessary reassurance to the promoters about the quality of services provided under an SQP.

7.5.3 A Next Best Alternative based on a direct diesel/hybrid equivalent of the NGT proposals could, in our view, be expected to offer much better value for money, whilst the full integration of the proposals with the existing bus network would offer the benefits of improved journey times and reliability to a wider cross-section of the community.

7.5.4 Indeed, we note with surprise in passing that the system has no plans to make use of kerb guidance, despite its highly successful operation in West Yorkshire on three corridors. We note the proven track record of high quality bus services using guideways in attracting additional patronage - particularly on the Scott Hall Road corridor, where the growth over the period since opening has far exceeded that forecast for NGT. This seems to have been ignored by the promoters.

7.6 System Operation and Procurement

7.6.1 A fully worked out strategy for this has yet to be created, and at this stage the promoters are keeping their options open. However, it would appear that the preferred strategy would be to let:

- one or more design and build contracts for the construction of the system, including a depot
- a contract for the supply of the vehicles (which might or might not include maintenance)

- an Operations and Maintenance contract for service delivery. It is currently expected that the promoters would retain revenue risk.

7.6.2 The alternative of a turnkey design, build, operate and maintain (DBOM) contract for the whole system has not been ruled out, nor the use of such an approach for parts of the system (e.g. the depot) is also considered a possibility.

7.6.3 All these options would however lock the promoters into a series of long term, potentially expensive contracts in which the risk ultimately would lie with the public sector. In particular, the anticipated method of delivering the system carries grave risks of systems integration which a single turnkey contract or a DBOM generally avoids.

7.6.4 Revenue risk would be a major issue, particularly where no SQP arrangements were delivered and therefore the system remained vulnerable to low-cost or low-quality bus competition. Use of untried SQP powers to protect NGT from competition would render the promoters liable to legal challenge. Meanwhile, as already discussed, the patronage and revenue forecasts are open to alternative interpretations and outcomes which could substantially reduce, or even eliminate, the projected revenue surplus (itself unquantified in the business case documents).

7.6.5 These ought all to be risks about which the politicians are informed – especially where an alternative exists which could leave risk with the private sector and leave the public sector simply with highway-based construction and maintenance issues which they ought to understand.

Conclusions and Recommendations 8

8.1 Strategic Fit

8.1.1 We believe that the current NGT proposals offer a poor strategic fit with the overall transport strategy required in Leeds.

8.1.2 We do not believe that the scheme if built would make a significant contribution to the achievement of Local Transport Plan objectives.

8.1.3 We believe that the Next Best Alternative evaluated in the PEBCS and earlier documentation was wrongly specified and designed to favour the promoters' primary choice rather than offer a genuine validation.

8.1.4 There is an argument to say that the whole approach to the issue has been designed to fit the promoters' objectives of maximising public sector control of the transport system in Leeds, rather than to promote integration and speedy improvements to the wider public transport network in the City.

8.1.5 Nevertheless, we believe that the segregated alignments and bus priority measures proposed by the NGT scheme would be of significant value to existing and potential passengers on the corridor(s) concerned.

8.1.6 The full integration of these projects with existing commercial bus services on the corridors would spread the benefits more widely and more quickly. As was seen with the implementation of the Scott Hall Road and East Leeds guided busway projects in the 1990s, such schemes are capable of incremental delivery and adaptation to changing circumstances.

8.2 Technology Choice

8.2.1 We believe that the evaluation methodology by which trolleybus was selected as the mode to be used was seriously flawed and based on misleading assertions.

8.2.2 We believe that the choice of trolleybus technology:

- increases the capital costs of the project unnecessarily by requiring expensive overheads and vehicles that cost between 2 and 2½ times the equivalent diesel or hybrid vehicle
- would be difficult to extend and/or reroute
- would result in a system that was inflexible and unable to respond to future changes in demand and in customer expectations

- would reduce the quality of life in requiring visually intrusive overhead wiring and supports

- would risk rendering the system permanently and unnecessarily reliable on public funds for future extension, maintenance and asset management

8.3 Project Forecasts

8.3.1 We believe that the forecast patronage on the system is overstated by at least 51%. This is as a result of inappropriate annualisation factors, falls in the volume of demand since the onset of the recession, and an exaggerated valuation of the passenger benefits of NGT over the existing bus product.

8.3.2 We have insufficient information to validate the revenue yields used in the PEBCS, but of course there would be a straight read across from patronage to revenue.

8.3.3 We have some difficulty in reconciling the operating costs of the proposed system with our own estimates, and note that the exclusion of depreciation from the PEBCS would mean that no provision would be made for the refurbishment and/or replacement of the fleet.

8.4 Project Delivery

8.4.1 The proposed method of project delivery would leave the public sector promoters exposed to key project and financial risks which they are less capable of managing than the private sector.

8.4.2 In particular, the splitting of the project delivery and construction contracts would expose the promoters to systems integration risks – a key issue in ensuring that the system could open on time and operate successfully and reliably.

8.4.3 We believe that the plan to retain revenue risk for the scheme in the public sector is inappropriate in current financial circumstances, especially given the high degree of uncertainty we have identified in the patronage and revenue forecasts.

8.4.4 We note that the failure to provide for depreciation in the operating cost estimates would mean that no provision would be made for vehicle replacement/refurbishment, thus further exposing the project to the need for future public sector funding – which might not necessarily be forthcoming at the time required.

8.5 Recommendations

8.5.1 In our view, major improvements to the existing bus product on the selected corridors under a Statutory Quality Partnership could deliver journey time and reliability improvements to a wider cross section of people than NGT. The project should be capable of incremental delivery in stages, so allowing benefits to be provided more quickly.

8.5.2 Based on experience and operation elsewhere, the planned segregated alignment and signal priority scheme should be capable of accommodating at least 24 vehicles per hour in each direction with full priority, permitting many more services to benefit from the improvements planned.

8.5.3 A bus-based scheme would enable the technology to be upgraded as new developments come on stream – for example, the scheme could be implemented with hybrid vehicles, which could be replaced in due course by electric vehicles able to take advantage of battery charging at stops and termini – a technology that is already operating in the United States and is under active development by at least three manufacturers in Europe.

APPENDIX 3

The New Bus for Leeds

APPENDIX 3: THE NEW BUS FOR LEEDS

1 Introduction

1.1 This Appendix is designed to illustrate the proposals which FWY has been developing for the future of its bus services in Leeds, which the company believes offers a strong and viable alternative to the LTVS proposals tabled by the Applicants.

1.2 These proposals are based on rapid deployment of a reconfigured bus product that offers amongst other things:

(a) faster and more predictable journey times;

(b) new vehicle design and smart ticketing to reduce stop dwell times through faster boarding and alighting;

(c) rationalised stops; and

(d) reduced emissions through the use of hybrid technology leading to longer term deployment of full electric vehicles as the technology becomes available.

1.3 These plans, grouped together as "The New Bus for Leeds" project, would offer:

(a) huge savings to the public purse compared with the cost of the LTVS proposals;

(b) a wider spread of the benefits of improved public transport to more areas of the city more quickly; and

(c) a major contribution to the achievement of Local Transport Plan objectives in a much shorter timescale than previously thought possible.

1.4 Growth in bus patronage is an essential element in improving public transport in Leeds and throughout West Yorkshire. Growth helps to keep fare levels lower despite increases in operating costs. Lower fare levels help people on lower incomes and also reduces the cost to the public purse of concessionary fare schemes. They also help to make buses more attractive to non-users, so helping to reduce congestion.

1.5 This Appendix first addresses the background to the developments, including customer research and operational experience, by both FirstGroup and other operators in intensive urban operation. It then goes on to draw the lessons from this work which have been used to derive a set of objectives for the New Bus for Leeds. Lastly, the Appendix shows how the programme will deliver against these objectives and against the wider strategic objectives set by the Local Transport Plan and other strategic views of the future.

2 Background

2.1 Extensive market research has been undertaken by a number of organisations, including Passenger Focus, (the statutory consumer body for the bus industry), the Department for Transport and operators themselves, in order to try to understand the views of customers and potential customers.

2.2 This knowledge and experience has given the bus industry a better understanding than it has ever previously had about what customers' needs are, how these can be met and what the likely responses are to given changes. Monitoring of outcomes and shifts in the market for bus services in different areas and operating circumstances has also contributed to a knowledge of what drives success in bus operation.

2.3 Every survey of the public who use and do not use buses shows that reliability is the number one factor in deciding whether or not to use the bus. The major cause of delay for buses, other than traffic congestion, is the time taken for passengers to board and alight.

2.4 Over the past decade, it has become clear that advances in technology, particularly smart ticketing, offer the opportunity to shift cash transactions off-bus with consequent advantages to bus stop dwell times and therefore to overall journey times. In turn this facilitates operational cost savings that can be reinvested elsewhere in the bus network.

2.5 Experience overseas, particularly elsewhere in Europe and South America, has shown that further reductions in stop dwell times can be achieved by the use of multi-door and/ or articulated vehicles. Indeed the bi-articulated vehicles used in leading South American bus-based rapid transit systems have enabled such systems to offer equivalent capacity to a tramway system at a fraction of the cost, with speedier implementation.

2.6 At the same time, other advances in technology have also resulted in huge reductions in emissions from diesel-powered buses, as well as the introduction of other forms of low-emission vehicles. Experiments and wider deployments have included buses driven by a variety of power trains, including hybrid diesel-electric, compressed natural gas (CNG), hydrogen and battery electric.

2.7 As a consequence of all of these changes, the bus product more specifically in Leeds has been evolving significantly over the last 25 years. Projects and investments by the local authorities and the operators mean that bus travel has improved beyond all recognition since the 1980s. This process continues as technology advances and new solutions become available. This Appendix sets out the next steps in that process of evolution.

3 Customer Research: understanding needs and aspirations

3.1 Three specific pieces of research have contributed to FWY's thinking about the future of bus services in Leeds and, indeed, throughout West Yorkshire:

(a) Work undertaken by Passenger Focus on what customer priorities for service delivery are and on the overall drivers of customer satisfaction;

(b) The Department for Transport's Autumn 2013 report on public attitudes towards bus services; and

(c) FirstGroup's own research amongst bus customers and potential customers in the Leeds and wider West Yorkshire markets, commissioned from The TAS Partnership in the Autumn of 2012.

3.2 Passenger Focus was appointed in April 2010 as the statutory consumer representative for the bus industry in England under the provisions of the Local Transport Act 2008. It undertakes wide-ranging research on customer views and attitudes, with the centrepiece of its work being the annual Customer Satisfaction survey, first undertaken in 2009. The most recent survey, in March 2013, obtained the views of over 22,000 passengers in England outside London.

3.3 Analysis of customer responses in 2009 demonstrated that the number of key factors were central to driving customer satisfaction with bus services. It is noticeable that the attributes of the vehicle itself do not feature in this list. These were:

(a) the length of the journey (including allowance for unpunctuality, if needed);

(b) the attitude of the driver;

(c) the timetable information provided;

(d) electronic information about bus times; and

(e) the feeling of personal safety and security.

3.4 This research was followed up in 2010 with further work on customers' priorities for improvement in the delivery of bus services, in which a sample of 3,800 people were asked for their views on what

improvements needed to be made to enhance their satisfaction with the service provided. A total of 30 attributes were evaluated and ranked, and the top ten are listed in Table 1 below.

Table 1: Passenger Priorities for Service Improvement[1]

Priority	Attribute
1	More buses are on time or within five minutes of when they are scheduled to arrive
2	Buses run more frequently at times when you want to use the bus
3	All passengers are able to get a seat on the bus for the duration of their journey
4	Tickets and passes are available that entitle you to travel on all bus services in your local area, not just those operated by a specific bus company
5	Buses go to a wider range of destinations in your local area
6	Bus fares, tickets and passes offer better value for money
7	All bus drivers are helpful and have a positive attitude
8	Accurate timetable and route information is available at all bus stops
9	Tickets and passes are available that entitle you to travel on all types of public transport in your local area, not just buses
10	All bus stops have a well-maintained shelter

3.5 It is clear that by no means are all these attributes within the immediate control of the bus operator. The unpredictable nature of traffic congestion is often responsible for unreliable service delivery, whilst facilities at stops and shelters are usually delivered by the local transport authority. In a Leeds and West Yorkshire context several of the aspirations are already met (for example about network and multi-modal ticketing) - although other research tends to show that better marketing could ensure that this was more widely understood.

3.6 Amongst travellers in Leeds, FWY commissioned research about attitudes to bus services in the Autumn of 2012, including samples of both bus users and non-users. As part of the survey, respondents were asked to name factors which would encourage them to use buses more often or, in the case of non-users, at all.

3.7 The factors named in the surveys by users are shown in Table 2 below, and those of non-users in Table 3.

Table 2: Bus Users in West Yorkshire – Factors to encourage greater bus use (September 2012)

Improvement/Attribute[2]	%
More reliable/keep to time	12%
Better value for money	6%
More frequent in day time	6%
More friendly/helpful drivers	6%
More frequent in evening	3%

[1] Bus Passenger Priorities for Service Improvement, Passenger Focus, March 2010.

[2] Respondents were able to name more than one attribute, so the total will be greater than 100%

Improvement/Attribute[2]	%
Cleaner buses/windows	2%
Faster journey time/less stops	2%
Real time timetables	2%
More room for buggies	1%
Better seating	1%
Run later in evening	1%
More convenient stops	1%
Air conditioning	1%
Others (less than 1%)	1%
No attribute named	63%
Respondents	652

Table 3: Non-Bus Users in Leeds – factors to encourage greater bus use (September 2012)[3]

Improvement/Attribute	%
Faster journey time	20%
Lower fares	17%
More frequent in day	11%
More frequent in evening	8%
More convenient stops	7%
More reliable	4%
Less crowded	3%
More room for buggies	2%
Friendlier drivers	1%
Cleaner buses	1%
Shelters at bus stops	1%
No attribute named	43%
Respondents	150

3.8 This research strongly suggests that the key to growth in bus use lies in the speed and predictability of the journey. Such improvements can be delivered by the improved bus product and are not exclusive to the LTVS proposals.

3.9 The Department for Transport undertakes regular surveys of attitudes towards buses and bus services, as part of an Office for National Statistics Opinions omnibus survey. The most recent survey took place in March 2013 (similar questions were asked previously in March 2011,

[3]. Respondents were able to name more than one attribute.

February 2009 and June 2007). A total of 910 people responded, with 476 using the bus at least once a year, but 428 (43%) never using the mode.

3.10 Two tables again help to illustrate the aspirations of both users and non-users towards the future development of bus services.

Table 4: Top Ten Reasons for not using the bus[4]

Reason for non-use	Car Owners	No Car Households
Car more convenient	62.4%	17.7%
Car quicker	35.5%	15.7%
Buses too infrequent	17.5%	7.2%
Bus takes too long	11.6%	12.9%
Bus fares too high	12.3%	19.7%
Cheaper by car	9.8%	7.8%
Prefer to walk/cycle	10.8%	22.8%
Difficult boarding	3.2%	14.6%
Difficult getting to stop	2.7%	11.2%
Lack of direct service	10.0%	9.2%

Table 5: Changes that would make people make more use of buses

Service Attribute /Improvement	All	Non Users	Users
Cheaper	38.0%	28.8%	46.2%
More Frequent	34.4%	26.9%	41.0%
Quicker	30.8%	23.7%	37.2%
Easier information	21.3%	19.2%	23.1%
Bus stop nearer	18.5%	14.7%	21.8%
Public policy measures			
More difficult to park	37.7%	36.9%	38.5%
Higher parking charges	35.7%	32.0%	39.0%
Road pricing	40.0%	37.8%	41.9%

3.11 The lessons from this research have driven the development of FWY's programme to transform its bus products around the country, under the Better Journeys for Life programme discussed below.

3.12 The key conclusions from the research are that journey speed, frequency and reliability remain at the top of the customer agenda. In this context, the LTVS project, which would 'split' the existing

[4] Public Attitudes to Buses: Great Britain, March 2013, published by the Department for Transport

frequency, particularly on the Headingley corridor, between existing bus services and the new trolleybus service, looks perverse. The clear danger that existing bus services would become slower and less frequent as a result of the introduction of LTVS also goes against the clearly expressed wishes of both users and potential users of existing bus services on the corridors.

3.13 The desire for better value for money in fares and ticketing has been addressed by recent changes made to the price of tickets by FWY, as part of a programme of changes being introduced by FirstGroup which has also affected networks in Manchester, Sheffield and Bristol. There is more work to do in this area. One way to ensure that fares remain at or below current real levels is to secure volume growth, so allowing existing operating costs to be spread over a higher number of passengers.

3.14 There is clearly a need to improve the journey speed on the corridors to be served, and this is where FWY believes that the reconfiguration of bus design and ticketing systems can assist greatly especially when supplemented by working in partnership with Metro and the Council on bus stop improvements and bus priority measures. This needs to be considered in the context of FWY's overall approach to the reconfiguration of its business under the Better Journeys for Life programme, which is discussed in the next section.

4 Better journeys for life

4.1 This sort of customer research, together with research commissioned internally, led FirstGroup to develop its Better Journeys for Life programme ("BJfL"), formally launched in January 2012. This heralded a programme of change in the group's approach to its UK bus business, placing stakeholders at the heart of what the business does and exceeding expectations wherever possible for customers, staff, communities, partners and shareholders. FirstGroup believes that it can deliver, "attractive, viable bus networks vital for building a better future for our economy, our environment and our communities".

4.2 At the heart of the BJfL project is a three year transformation project to make the group's bus services more reliable, more attractive and offering better value for money - and projects and trials are under way in many parts of the country to deliver these improvements. Vital to the success of BJfL is the realisation that previous business practice within the group was misdirected and that progressive change is being implemented which will completely change the culture of the business over time.

4.3 At the heart of these initiatives is a major investment in new ticketing technology at a cost of more than £27m designed to make it easier for customers to pay using their debit cards, credit cards and mobile phones, as well as “oyster style” smart cards, making boarding quicker and journey times more reliable.

4.4 In order to ensure that maximum advantage is taken of this new investment, FirstGroup along with other industry colleagues has been working on optimising vehicle designs to speed up journeys and reduce stop dwell times.

4.5 FirstGroup's award-winning[5] approach to the environment and carbon reduction is at the heart of the BJfL programme as well: the group is committed to being "a low carbon transport alternative.

(a) "Our Climate Change strategy sets out our carbon reduction targets";

(b) "All our buses carry DriveGreen LED displays that tell the driver how fuel efficiently they are driving. Data is recorded and drivers can review and compare their scores with their

[5] Environment Award, UK Bus Awards: Winner in 2012. Runner Up in 2011. Highly Commended in 2013. Each for different environmental projects, including the Drive Green initiative (2011), the “Small Changes, Big Difference” programme (2012) and the Recycling Programme (2013).

colleagues. At the end of each year the drivers with the best performance are recognised through our Safety and Environmental Awards scheme";

(c) "We're working actively with our vehicle suppliers to further reduce carbon emissions from our vehicles"; and

(d) "We're dedicated to evaluating new technology including hybrid buses, fully electric battery powered buses and Hydrogen buses".

4.6 Practical examples of this exist with hybrid buses in Leeds, electric vehicles on order for York in 2014 and hydrogen-powered vehicles in Aberdeen - as well as ongoing work to reduce the weight, emissions and environmental impact of diesel buses. We have been working in partnership with local authorities to deliver wider air quality and sustainability objectives.

4.7 Low emission technology has made great strides in the last 10 years and further significant advances are certain to be achieved by the time NGT is scheduled to open in 2019, let alone by the end of the 30 years life of the NGT project. Through having committed £250m to NGT with further hoped routes elsewhere in Leeds, the city will be deprived of investment in much further advanced, and cheaper, alternatives and will continue for coming decades to be stuck in the past when it comes to its public transport system.

5 Vehicle configuration

5.1 Research has shown how average boarding time per vehicle could be reduced substantially from an average of eight seconds when a cash transaction is involved to 2.5 seconds using a contactless smartcard or less than one second when tickets are validated in 'stations' off bus. As can be seen from the table below, dedicated systems with 'station' environments can deliver even faster transaction times, but require segregation and extensive roadside facilities which are not deliverable in the present context.

Table 6: Average Passenger Loading Times for Different Bus Rapid Transit Systems[6]

System	Average Loading time per passenger (seconds)
Cash payment to the driver, Joinville	6-8[7]
Single Ticket using magnetic strip, Joinville	4[8]
Contactless Smart Card, Joinville[9]	2.5
Validation at terminal Joinville (3 doors articulated)	0.3
Tube Station Curitiba (2 doors)	0.25
Tube Station/Terminal Curitiba (5 doors bi-articulated)	0.1
TransMilenio Articulated Unit (4 doors)	0.08
China (Beijing and Hangzhou)	0.8 - 0.9

[6] Sources: Passebus, TransMilenio Transcraft (2003) and WSA (2006). *BRT In Latin America* by Alan Cannell. TAS Publications 2008.

[7] Tests showed that this time varied according to the fare and the change that had to be handed back.

[7] Magnetic strip tickets have a failure rate of about 1 in 1000, which causes great loss in time. This is negligible for smartcards.

[8] In a UK context, current smartcard transaction times on ITSO compliant systems tend to be higher, though work is being done to address this issue.

5.2 In the UK, research by The TAS Partnership in various parts of the UK showed great variability with transactions averaging between 6 and 14.7 seconds per passenger on single door buses with predominantly cash transactions (this research took place prior to the introduction of free concessionary travel).

5.3 It was a combination of the need for speed, capacity and accessibility that led in the late 1990s and early 2000s to a series of trials with articulated buses. FirstGroup led the way with trials in Aberdeen, followed by the introduction of batches of vehicle into service in Manchester, Leeds, Southampton and York.

5.4 In London, it was becoming clear around the turn of the century that the crew-operated Routemaster fleet could not be sustained for much longer, and a successful trial of FirstGroup articulated vehicles in the capital took place in October 2001. This led to the introduction of the type on two routes in central London in June 2002, followed by ten other routes over the following four years.

5.5 Within FirstGroup, there was a desire to take the articulated concept a stage further, and to develop a specially designed vehicle that could mirror some of the attractiveness of a modern tram. This led to the development of the new "Street Car" (or "FTR") which entered service in York in 2006, followed by Leeds in 2007 and Swansea in 2009. The Leeds and York vehicles were refurbished and relaunched on the branded "Hyperlink " service between Leeds and Bradford in the autumn of 2012.

5.6 Failure of the planned on-vehicle ticketing systems led to the employment of customer hosts on FTR vehicles in all three operating areas, a feature which has undoubtedly proved popular with customers.

5.7 Despite their apparent advantages, experience in operation has generally shown that the operation of articulated buses is not without its problems in the UK. This was especially true in London, where the vehicles have been withdrawn.

5.8 From experience in operation, it is clear that articulated vehicles:

(a) can be very fast in operation since boarding and alighting times are greatly reduced, particularly (as in London) when passengers are allowed to board at all doors; and

(b) are capable of carrying large numbers of people for short distances at peak hours, so providing a very cost effective means of providing peak capacity.

5.9 Notwithstanding these advantages, other disadvantages from their operation emerged. Articulated buses:

(a) tend to be unpopular with other road users (particularly cyclists);

(b) are disliked by Highway Authorities for the amount of road space they occupy - which can be a particular issue at congested junctions;

(c) are less attractive for longer journeys, to older passengers and to people with a mobility handicap, as a consequence of a lower proportion of seats than traditionally provided in the UK;

(d) offer problems of increased fare evasion, particularly on short journeys or when heavily loaded;

(e) are not appropriate for all environments, particularly in more confined areas with narrow streets. They work better in areas with more spacious road layouts, such as Leeds-Bradford corridor; and

(f) are not easily scaleable as highway modifications are often necessary in order to permit safe and satisfactory operation.

5.10 As a consequence, operators - led by Transport for London - began to think again about how some of the advantages of the articulated bus could be captured by alternative designs.

5.11 The alternative needs to offer:

(a) very fast boarding and alighting;

(b) higher capacity than a rigid single decker; and

(c) full accessibility for customers who are elderly or otherwise have reduced mobility.

5.12 These criteria were at the heart of Transport for London's aspirations for the New Bus for London ("NBfL"), a project which comprised a design competition in 2008/09, a tendering process with manufacturers in 2009 and two years of development work before the prototype entered service on route 38 in February 2012. This was followed by seven further pre-production models on a programme of tests. An order for 600 vehicles followed, and the first production vehicles entered service on route 24 in June 2013.

5.13 Though the political imperative for a "hop on, hop off" facility akin to the old London Routemaster bus has tended to dominate the media discussion of the NBfL, the vehicle is in fact designed to be operated with or without conductors, and is used without them during the evenings and weekends on the routes it is running so far (24, 9, 11 and 390). On the next route to be converted, the 148, TfL has announced that the vehicle will be one person operated at all times. Meanwhile, the prototypes on route 38 are now also operating in one person mode.

5.14 From observation of the vehicles in service in central London, FWY has concluded that the design principles of the NBfL or one similar to it in concept, are applicable on core bus corridors in West Yorkshire, beginning with the LTVS corridors, with a view to a rapid extension of the concept to other busy corridors in Leeds. FWY plans to consult with local authority partners and other stakeholders on the detailed configuration of the vehicles within the design platform provided by Wrights, the manufacturer of NBfL.

6 Infrastructure investment

6.1 As part of the proposals, FWY would be seeking the agreement of the Applicants to deliver some of the infrastructure projects currently contained in this Order for the use of licensed buses but which can be achieved without the need for the Order.

6.2 FWY envisages that these projects would be delivered within the "Give to Get" principles which are being established within West Yorkshire to cover infrastructure projects. Under "Give to Get", investment by the District Councils and Metro in journey time improvements would be 'rewarded' by a series of measures undertaken by the operators to re-invest any savings made in operating costs in service improvements. These might include a direct response (for example in increasing the frequency of the services operating along the corridor) or an indirect response (such as selected reductions in fares, additional departures in the early morning or late evening or other 'soft' improvements which could not otherwise be justified.

6.3 Infrastructure improvements that could deliver reductions in journey time include:

(a) priority lanes or physically separated alignment to permit buses to avoid specific pinch points;

(b) junction re-design to favour buses, especially where turning movements are required;

(c) queue relocation schemes to smooth the passage of buses through congested junctions; and

(d) bus stop rationalisation to optimise the balance between faster journeys and accessibility to services.

6.4 Where the improvements on the NGT corridor involve segregated infrastructure, FWY believes that use should be made of the same kerb guidance technology as has been employed successfully for some years elsewhere in the city.

6.5 This has a number of advantages, including:

(a) minimised land take;

(b) self-enforcing segregation;

(c) ability to be constructed incrementally as funding becomes available;

(d) use in conjunction with access charges or operator capital contribution to enable a private sector contribution to the investment and/or an on-going funding stream to assist with maintenance and future developments and

(e) interface with existing routes and services so as to avoid a two tier public transport system in the city.

6.6 The table sets out below indicates the nature and extent of the priority measures envisaged for the corridor covered by the Applicants' proposals.

Table 7: Proposed Infrastructure Works to improve bus services on the NGT Corridor

Proposed Infrastructure/Priority Works
Rerouting of southbound buses via Blenheim Walk so as to remove the diversion via Blenheim Terrace and Blackman Lane, to create fast access to the city centre
Actions to reduce the impact of traffic congestion on buses:
- rigorous enforcement of bus lane priority
- provision of automatic priority for approved buses at traffic signals throughout the corridor
- provision of bus priority at the Lawnswood roundabout (but within the existing carriageway) as part of a signalisation of that roundabout.
- redesign of the Hyde Park /Victoria road junction to provide greater priority for buses and improved siting of the stops
- improvement/extension of existing bus lanes, including a northbound bus lane on Headingley Hill, the introduction of bus gates to enforce access controls and the use of tidal bus lanes to optimise priority during peaks
A comprehensive traffic management scheme in Headingley giving greater priority to buses in the area of the Arndale Centre.
Construction of the segregated alignments in South Leeds as planned but as kerb-guided busways, allowing fast access to the City Centre and bus station for inter-urban and city routes on the A61 and Hunslet/Middleton corridors
Creation of an improved priority route through the City Centre including better northbound routes through City Square

7 Public policy objectives

7.1 In addition to meeting customer requirements and aspirations, the New Bus for Leeds project also needs to deliver against public policy and economic objectives. The key document in this context is the statutory transport plan for West Yorkshire. This third iteration of the West Yorkshire Local Transport Plan (known as LTP3) was adopted by the Integrated Transport Authority in April 2011.

7.2 The over-arching objective is described as "Working together to ensure that West Yorkshire's transport system connects people and places in ways that support the economy, the environment and quality of life".

7.3 The three key objectives of the LTP are:

(a) Economy - to improve connectivity to support economic activity and growth in West Yorkshire and the Leeds City Region;

(b) Low Carbon - to make substantial progress towards a low carbon, sustainable transport system for West Yorkshire, while recognising transport's contribution to national carbon reduction plans; and

(c) Quality of Life - to enhance the quality of life of people living in, working in and visiting West Yorkshire.

7.4 Ten high level indicators have been developed to track progress against the three primary objectives:

(a) satisfaction with all transport;

(b) bus journey times;

(c) car journey time reliability;

(d) access to labour markets;

(e) principal road condition;

(f) low carbon trips;

(g) public transport patronage;

(h) all road casualties (people killed and seriously injured);

(i) access to local services; and

(j) transport emissions.

7.5 Of particular relevance to both the LTVS scheme and the New Bus for Leeds, the Plan strategy contains a number of elements in relation to air quality , including traffic demand management measures, focusing on commuter journeys; encouraging more sustainable travel; actions to reduce vehicle emissions; and measures to adapt to the effects of climate change.

8 The New Bus for Leeds Project

8.1 The project to redesigning of the bus product is therefore being approached with the objective of delivering against the aspirations of existing customers and potential future customers, in the context of the objectives of the Local Transport Plan.

8.2 FWY believes that the New Bus for Leeds needs to deliver the following customer aspirations:

(a) fastest possible journey times, delivered by:

(i) smart ticketing allowing payment by phone, debit card and “Oyster style” smartcards to reduce and eventually eliminate cash transactions with the driver;

(ii) level boarding at stops, achieved by installation of kerb guidance or Kassel kerbs coupled with enforcement of bus stop clearway orders;

(iii) customer hosts at busy times to provide assistance;

(iv) traffic signal priority throughout the city;

(v) targeted infrastructure improvements to reduce delays and make journey times as predictable and reliable as possible delivered under the 'Give to Get' scheme discussed in section 6 above;

(vi) introduction of buses with multi-door boarding and alighting to minimise stop dwell time; and

(vii) weight saving design and hybrid or battery power to reduce emissions;

(b) highest possible frequency with extended operating hours, including 24 hour operation where this can be justified;

(c) high ratio of seats to total capacity to meet customer desires for a seat throughout the journey where possible; and

(d) flexibility of response: the ability to adjust frequencies and capacity to changes in demand.

8.3 Experience elsewhere has shown that additional on-board features are attractive to customers and generate additional patronage and modal shift. These include:

(a) high standards of seating including use of leather;

(b) high standards of ventilation and temperature control; and

(c) free customer Wi-Fi to facilitate use of smart phones, tablets and laptops during the journey.

8.4 In keeping with its own BJfL promise on the environment, FWY believes that the New Bus for Leeds can contribute decisively to the Applicants' aspirations for carbon reduction by the adoption of low emission technology (hybrid, battery or compressed natural gas) for the new vehicles. Rapid introduction of such designs across Leeds would make much more of a difference to local air quality and overall carbon emissions than implementing LTVS. Success in achieving city-wide modal shift from car to bus would make an even bigger impact. An illustration of how the the New Bus for Leeds could look is attached at Appendix 3.1

8.5 Under the proposals being developed for the New Bus for Leeds project, the first phase would see approximately 130 vehicles and associated improvements deployed on:

(a) the existing services 1 and 6 (the A660 corridor);

(b) Service 4 (Pudsey-Seacroft);

(c) the 7 group of routes (the A61 Scott Hall Road corridor);

(d) Services 33/33A (the A65 Kirkstall Road corridor);

(e) Service 40 (Leeds-Seacroft);

(f) Service 56 (Whinmoor-Moor Grange); and

(g) Service 72 (Leeds-Bradford), currently served by the 'FTR' Hyperlink vehicles.

8.6 In Phase 2, deployment of a further 130 vehicles is envisaged, on the Dewsbury Road and Middleton corridors (routes 2, 3/3A, 12 and 13/13A) and on services 16/16A (Pudsey-Whinmoor), 42 (Old Farnley-Fearnville), 49 (Bramley-Monkswood Gate), 50/50A (Horsforth-Seacroft) and 51/52 (Moor Allerton-Morley).

9 The benefits of the New Bus for Leeds

9.1 A comparison of the benefits of the LTVS proposals contained in the Order and the New Bus for Leeds is provided in the table at Table 8 below.

9.2 Under the New Bus for Leeds proposals, there is a considerable saving in costs to the public sector:

(a) the vehicles and ticketing system will be funded by FWY as part of its normal commercial investment activities, and the system would not require electrification infrastructure;

(b) the bus services are being operated at the commercial risk of the operator, at no risk to the public sector and would continue to be so.; and

(c) there would be no need to provide a new depot for trolley vehicles .

9.3 The New Bus for Leeds is scaleable much more rapidly than the Applicants' proposals, and could therefore be delivered to a wider cross section of the population of Leeds, and indeed other areas of West Yorkshire, well in advance of the planned opening date of LTVS in 2019.

9.4 The visual intrusion and environmental impact of any infrastructure improvement works carried out under the New Bus for Leeds would not be as great as for the proposed LTVS works. Since there would be no requirement for the installation of Overhead Electric Equipment (OHLE) and no requirement to remove trees in environmentally sensitive areas in order to protect wires, the New Bus for Leeds would deliver benefits with much less detrimental effect on the existing quality of life in the A660 corridor.

Table 8: Benefits of LTVS and New Bus for Leeds Compared

Claimed benefit from LTVS	Benefit from New Bus for Leeds
Reduced public transport journey times, particularly at peak travel times. Limited to LTVS journeys, with risk of worsening service to other bus users	Would be delivered by new services on a wide variety of corridors
Improved journey time punctuality coupled with high frequency services from early morning to late at night	Reliability could be improved by programme of infrastructure works and use of some of the planned LTVS alignment for all buses High frequency already delivered: further increases can be introduced in response to growth in demand, quickly and flexibly
High quality stops with shelters and real time information and offering level boarding to the NGT vehicle	Both could be delivered by the New Bus for Leeds
Park & ride sites at key locations attractive to city bound traffic	New Bus for Leeds could serve Park & Ride sites more cheaply and more efficiently, with dedicated services at busy times
Modern passenger vehicles offering improved quality of travel	The New Bus for Leeds would provide this.
Linking north and south Leeds and making it easier for people to travel to work and improve access to key destination across the route	The existing bus network already provides extensive cross city links. This could be developed and enhanced by the New Bus for Leeds, more quickly and more cost effectively than LTVS.

Claimed benefit from LTVS	Benefit from New Bus for Leeds
Reduction in congestion levels and improvements to air quality	The New Bus for Leeds would deliver these more quickly and more cheaply.
NGT has the potential to create up to 4,000 new jobs in construction, ancillary services and by linking people to employment opportunities and encouraging inward investment into the City.	A more rapid improvement to the wider bus network would deliver equivalent economic benefits more quickly and more cheaply.
NGT is forecast to produce a 3% increase in output, equivalent to £176 million boost to the economy per annum.	

10 Delivery of objectives

10.1 A common objective between FWY and the Applicants is for Leeds to have a radical improvement in public transport that enhances its image and boosts its status.

10.2 FWY is very concerned that by adopting, and thereafter being locked into, outmoded 100 year old trolleybus technology, this will not be achieved. On the other hand, introducing the New Bus for Leeds vehicle, combined with infrastructure improvements, will bring radical improvements to far more passengers and in a much shorter time. It will also make Leeds stand out as a trailblazer.

10.3 In addition to offering these outcomes more quickly and at a lower cost to the taxpayer, the New bus for Leeds would deliver a better means of delivering the NGT objectives, as set out in paragraph 3.8 of the Applicants' Planning Statement, and with much less disruption to the life of the city during construction.

10.4 The reasons for this belief are summarised in Table 9 below.

Table 9: Delivery of New Bus for Leeds against stated NGT Objectives

NGT Objective	New Bus for Leeds
Maximise growth of the Leeds economy by enhancing its competitive position and facilitating future employment and population growth	A more rapid and wider deployment of an enhanced bus product would deliver economic benefits to the city as a whole rather than one corridor. Reducing journey times for all bus passengers would deliver a major boost to economic efficiency.
Support and facilitate the sustainable growth of Leeds, recognising the importance of its city centre to the future economy of the Leeds City Region	Providing a better bus network across the whole city would make the city a more attractive place in which to live and work.

NGT Objective	New Bus for Leeds
Support and facilitate targeted regeneration initiatives and economic growth in the more deprived areas of Leeds	FWY's introduction of better value for money fares is already contributing to this. An enhanced bus product that achieves growth and modal shift will contribute substantially to regeneration by improving links throughout the city.
Improve the efficiency of the City's public transport and road networks.	Reducing journey times for all bus passengers would deliver a major boost to economic efficiency and assist with modal shift to reduce congestion.
Reduce transport's emissions of CO_2 and other greenhouse gases	Deployment of low carbon vehicles across the whole bus network would make a quicker and more widespread impact on air quality and carbon emissions. More advanced technology with low or zero emissions would be deployed at the same time.
Promote quality of life through a safe and healthy built and natural environment	The lack of OHLE infrastructure, the retention of trees and avoiding the visual impact of the LTVS project will assist with this objective.
Contribute to enhanced quality of life by improving access for all to jobs and services	Improvements to the wider Leeds bus network can deliver this objective more quickly and to a wider cross section of the population.

APPENDIX 3.1 – The New Bus for Leeds (illustrative)

APPENDIX 4

Schedule of existing commercial bus services affected by the services proposed under the Order

Appendix 4

Existing Commercial Bus Services affected by the Applicants' Proposals

Service number	Route and Terminals	Daytime Frequency (mins)	Affected section
	Northern Corridor		
1	Holt Park – Lawnswood – Headingley – Leeds - Beeston	7/8	Between City Square and Holt Park
6	Leeds – Headingley - Cookridge – Tinshill - Holt Park	10	Between Headrow and Holt Park
28	Clarence Dock – Leeds – Headingley – Adel	20	Between Clarence Dock and Weetwood Lane
97	Leeds - Headingley – Horsforth – Yeadon – Guiseley	20	Between Headrow and Lawnswood
X84	Leeds – Headingley – Bramhope – Otley – Ilkley - Skipton	20	Between Headrow and Bodington
	Southern Corridor		
12	Middleton – Belle Isle – Hunslet – Leeds – Harehills – Roundhay Park	10	Between Leeds Bridge and Belle Isle Circle
13/13A	Middleton – Belle Isle – Hunslet – Leeds – Harehills – Brackenwood/ Gledhow	10	
48	Middleton – Hunslet – Leeds – Chapel Allerton – Moortown - Wigton Moor	60	
74	Middleton – Beeston – Leeds – Hunslet – Middleton	30	
85	Bramley – Leeds – Hunslet – Middleton – Thorpe – East Ardsley - Morley	60	Between Leeds Bridge and Balm Road, then also Middleton Rd/Middleton Ring Road
86	Middleton – Belle Isle – Hunslet – Holbeck – Armley – Bramley	60	Between Corn Exchange and Balm Road, then also Middleton Rd/Middleton Ring Road
87	Bramley – Leeds – Hunslet – Middleton – Parkwood Estate – White Rose centre – Morley – East Ardsley	60	Between Hunslet Church St and Middleton Rd/Middleton Ring Road

Diagrams of how these routes, together with those operated by Arriva, interface with the NGT proposals can be found at Figures C, D and E of the TAS Report at Appendix 2.

APPENDIX 5

Schedule of existing cross city links provided by FWY and affected by the services to be provided under the Order

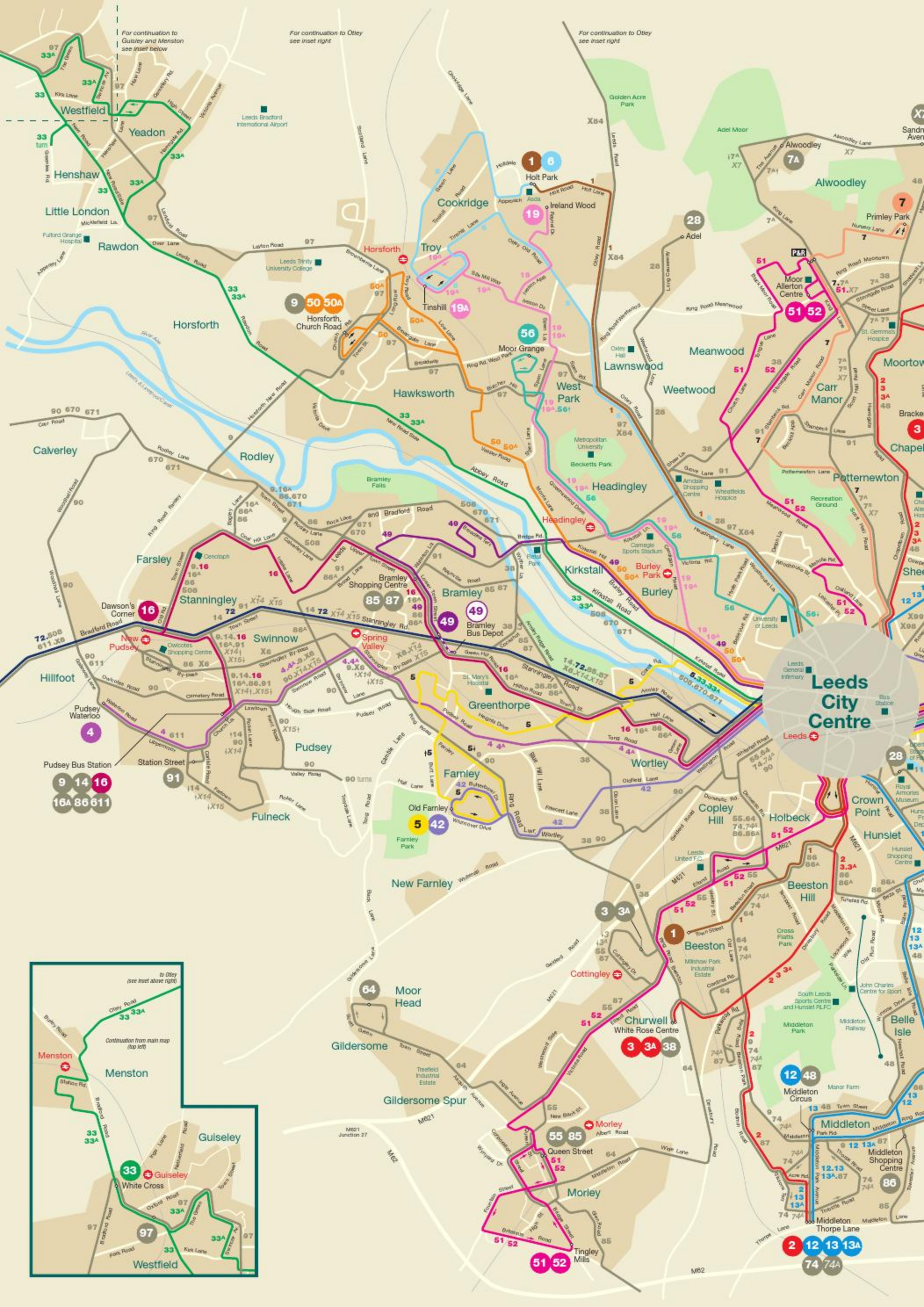
Appendix 5

Cross City Services

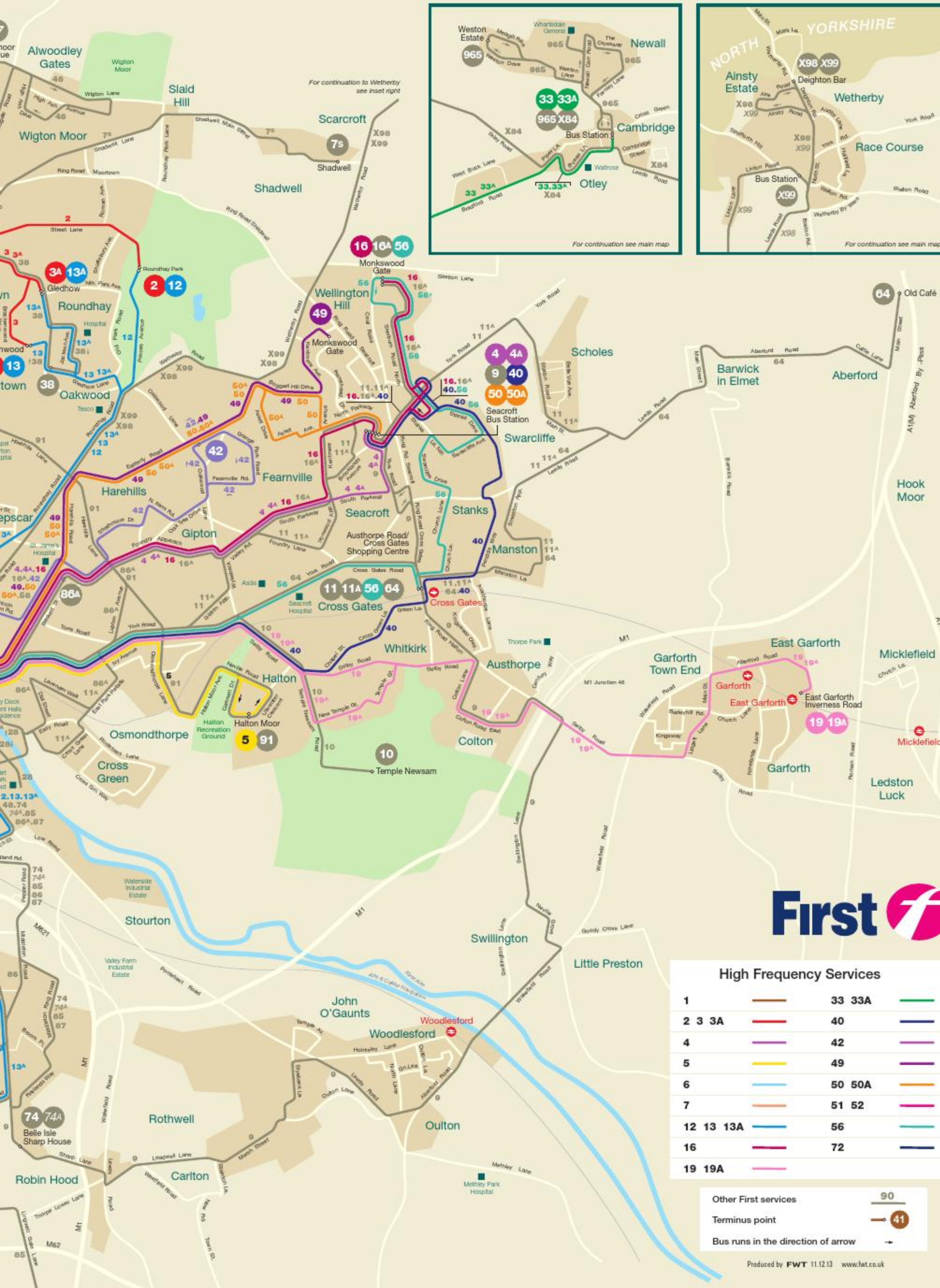
The following is a schedule of the current cross city services provided by FWY away from the corridor affected by the Order. As can be seen, these provide a comprehensive set of links across the City Centre to major destinations such as St James's Hospital and the White Rose Centre, a major retail centre to the south of the city. Cross city links are also provided to sub-regional centres such as Pudsey, Morley and Shipley.
Any additional delays prompted by the granting of extra priority to NGT vehicles could jeopardise FWY's ability to maintain cross-city links.

Service No	Route Description	Daytime Frequency (mins)
2	Middleton - Dewsbury Road - Leeds - Chapeltown	10
3/3A	Brackenwood/Gledhow - Chapeltown – Leeds - Dewsbury Road - White Rose Centre	10
4/4A	Galloway Lane (4)/Highfield Green (4A) - Pudsey - Gamecock Inn - Copley Hill - Leeds - Gipton - Seacroft	10
5	Old Farnley - Armley - Leeds - Halton Moor	20 (cross city), 10 Old Farnley-Leeds
12	Middleton - Belle Isle - Hunslet - Leeds - Harehills - Roundhay Park	10
13/13A	Brackenwood/Gledhow - Harehills - Leeds - Hunslet - Belle Isle - Middleton	10
16/16A	Pudsey - Farsley – Rodley (16A) - Bramley - Armley - Copley Hill - Leeds - Gipton - St James's Hospital - Seacroft – Whinmoor	10
19/19A	Ireland Wood (19) - Tinshill (19A) - West Park - Headingley - Burley - Leeds - York Road - Halton – Whitkirk - Colton - Garforth - East Garforth	30 each
42	Old Farnley - Lower Wortley - Copley Hill - Leeds - St James's Hospital - Gipton - Fearnville - Oakwood (McDonalds)	10
49	Bramley - Kirkstall - Leeds - St James's Hospital - Harehills - Easterly Road - Monkswood Gate	10
50/50A	Horsforth - Hawksworth - Kirkstall - Leeds - St James's Hospital - Harehills - Easterly Road – Seacroft	10
51/52	Moor Allerton – Meanwood – Little London – Leeds – Churwell – Morley – Tingley Mills	15/20 each
56	Moor Grange – Headingley – Leeds – York Road – Crossgates – Swancliffe – Whinmoor	8
62/62A	Cross Gates – Leeds – Old Farnley – Armley – Swinrow (62) – Troydale (62A) – Pudsey – Greengates (62) – Shipley (62)	60 each
64	Gildersome – Morley – White Rose Centre – Beeston – Holbeck – Leeds – York Road – Crossgates – Barwick-in-Elmet – Aberford	30

For ease of reference, a map of the Leeds bus network is shown overleaf.


For continuation to Guisley and Menston see inset below
For continuation to Otley see inset right
For continuation to Otley see inset right
Westfield
Yeadon
Henshaw
Little London
Rawdon
Leeds Bradford International Airport
Golden Acre Park
Adel Moor
Alwoodley
Alwoodley
Primley Park
Adel
Holt Park
Ireland Wood
Cookridge
Troy
Horsforth
Tinshill
Horsforth, Church Road
Moor Grange
Horsforth
Hawksworth
West Park
Lawnswood
Meanwood
Weetwood
Carr Manor
Moor Allerton Centre
Moortown
Chapel
Calverley
Rodley
Farsley
Stanningley
Dawson's Corner
New Pudsey
Swinnow
Bramley Falls
Bramley Shopping Centre
Bramley
Bramley Bus Depot
Spring Valley
Headingley
Metropolitan University
Becketts Park
Arndale Shopping Centre
Wheatfields Hospice
Recreation Ground
Potternewton
Burley Park
Burley
Kirkstall
Carnegie Sports Stadium
University of Leeds
Hillfoot
Pudsey Waterloo
Pudsey Bus Station
Station Street
Pudsey
Fulneck
Greenthorpe
St. Mary's Hospital
Wortley
Farnley
Old Farnley
Farnley Park
New Farnley
Copley Hill
Holbeck
Beeston Hill
Crown Point
Hunslet
Leeds United F.C.
Leeds City Centre
Leeds
Beeston
Cottingley
Churwell
White Rose Centre
Moor Head
Gildersome
Gildersome Spur
Morley
Queen Street
Middleton
Middleton Circus
Middleton Thorpe Lane
Belle Isle
Middleton Shopping Centre
Tingley Mills
Menston
Guiseley
White Cross
Westfield
Continuation from main map (top left)
to Otley (see inset above right)
M621
M62
M621 Junction 27

Leeds Network Map



First

High Frequency Services

1		33 33A	
2 3 3A		40	
4		42	
5		49	
6		50 50A	
7		51 52	
12 13 13A		56	
16		72	
19 19A			

Other First services 90

Terminus point 41

Bus runs in the direction of arrow

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APPENDIX 6

Schedule of additional cross city links which could be provided if priority and reliability of the Leeds bus network could be improved

Appendix 6

Additional Cross City Links

As was seen in Appendix 5, FWY currently operates a wide variety of cross-city services in Leeds. Nevertheless, there are a number of services which currently terminate in the city centre and which therefore could be capable of extension to provide new links or extra capacity on existing ones.

Service No	Route Description
6	Leeds – Headingley – Holt Park
7	Leeds – Scott Hall – Carr Manor – Moortown – Primley Park
7A	Leeds – Scott Hall Road – Moortown – Alwoodley
7S	Leeds – Scott Hall Road – Moortown – Shadwell
10	Leeds – York Road – Halton Dial – Temple Newsam
11/11A	Leeds – Gipton – Seacroft – Scoles – Cross Gates
33/33A	Leeds – Kirkstall – Horsforth – Rawdon
40	Leeds – Halton – Swancliffe – Seacroft
55	Leeds – Holbeck – Cottingley – Morley
72	Leeds – Armley – Bramley – Stanningley – Thornton – Bradford

Additional destinations could include existing trip attractors such as St James's Hospital, the White Rose Centre or other major employment areas such as Cross Gates, the Hunslet/Thwaite Gate areas and planned major land use developments in the city.
New developments scheduled to become major centres of employment and trip attraction include:

- the Aire Valley Leeds Enterprise Zone, adjacent to the proposed East Leeds link road to the east of the city centre, expected to create up to 9,500 jobs by 2025.
- the Kirkstall Forge site adjacent to the A65 to the west of the city centre: this 65 acre site incorporates plans for 300,000 sq ft of office space, 1,000 new homes and a new railway station.

Neither of these developments would be served by NGT.

FWY constantly monitors demand for its services and is committed to providing extra capacity and new links as and when sufficient demand is forthcoming. FWY is keen to work in partnership with developers and local authorities to ensure that these and other developments have the best possible public transport links.
However, the provision of additional links across the centre would not be possible if the existing reliability and journey time predictability on the corridors already served were to be jeopardised.